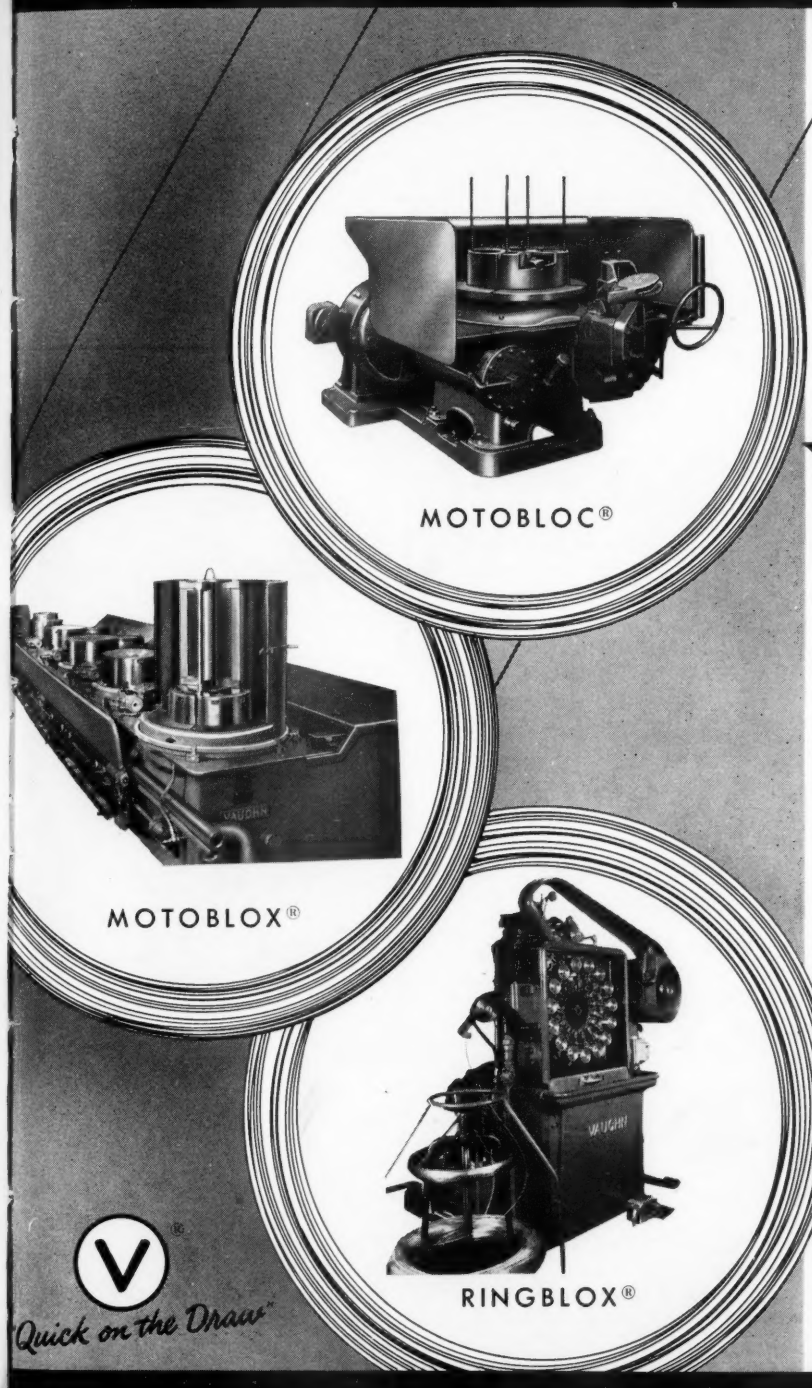
WIRE AND WIRE PRODUCTS

MARCH 1953



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OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

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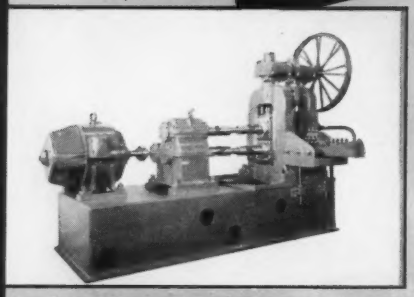
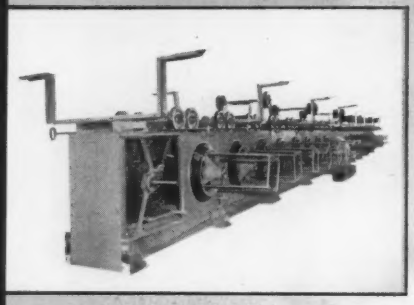
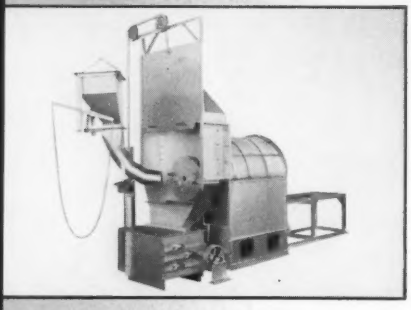


2—Hi Wire Flattening Mill



Wire Galvanizing Take-Up Frame



Nail Galvanizing Unit

In the past few years tremendous progress has been experienced in the field of wire machinery. Production speeds have been tripled and quadrupled. Product quality has been greatly improved. Machines have been made easier to operate and maintain.

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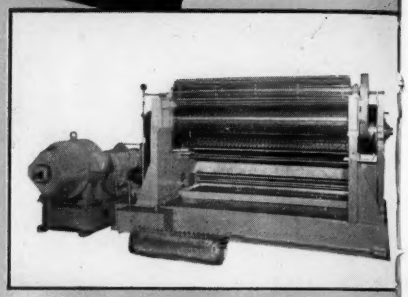
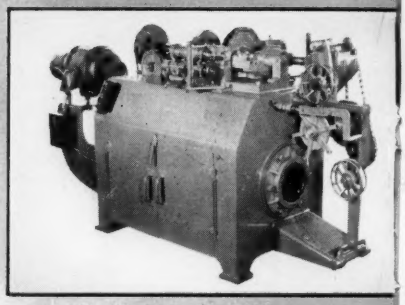
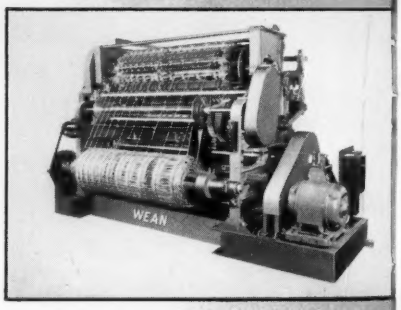


Hexagon Netting Machine

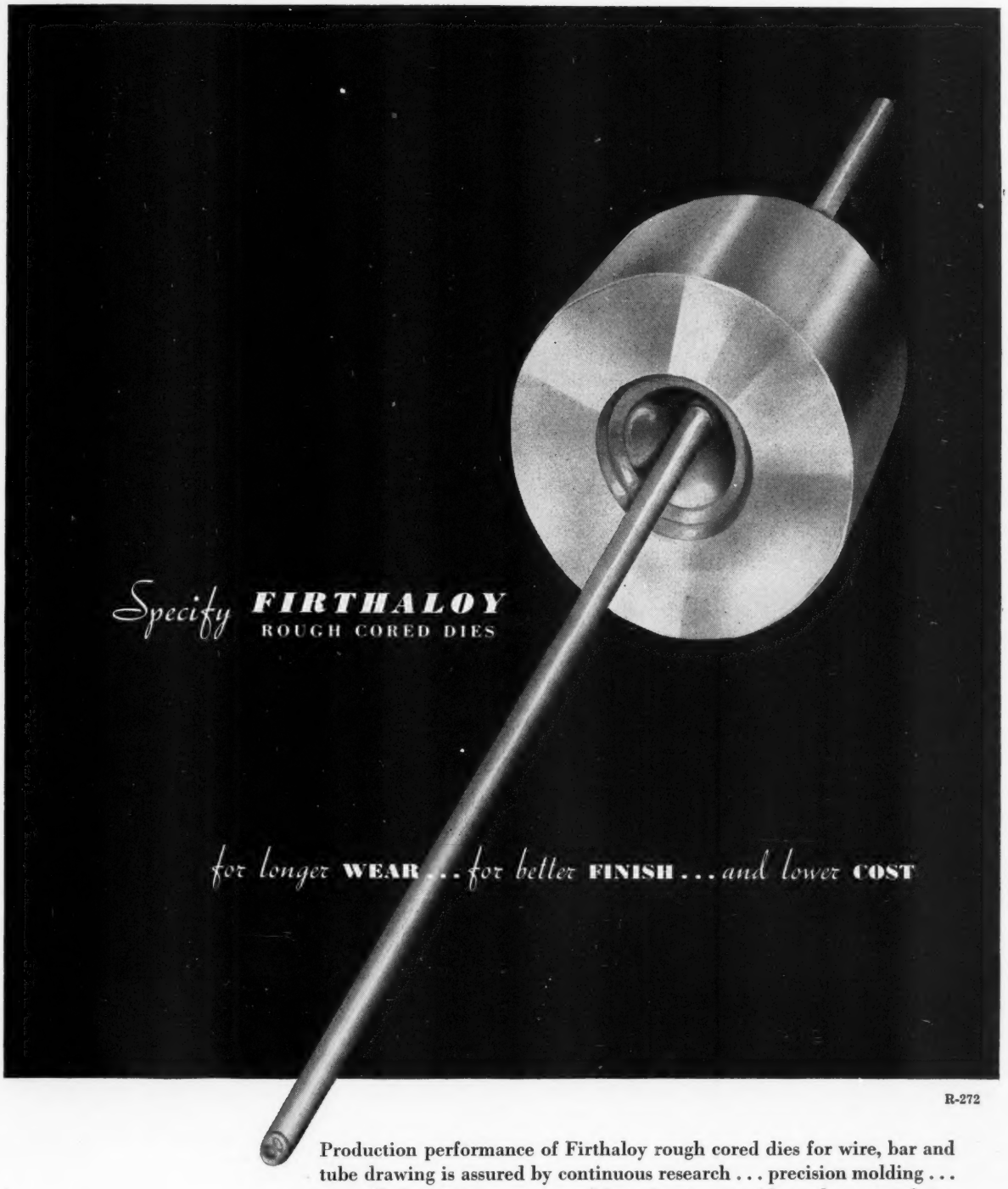


2 or 4—Point Barbed Wire Machine



Hinge — Joint Fence Machine

Wean Equipment Corporation
CLEVELAND, OHIO



R-272

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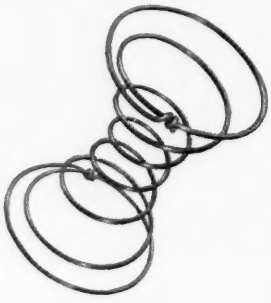
Comfort comes naturally



Comfort, according to Webster, is "a state of contented enjoyment, of ease and satisfaction of body or mind, or both."

Manufacturers build that kind of comfort into their furniture and bedding when they specify Silver Star Spring Wire. There's nothing more relaxing, more restfully buoyant than steel springs, and Silver Star is special-analysis, high-carbon steel wire, engineered for this application alone.

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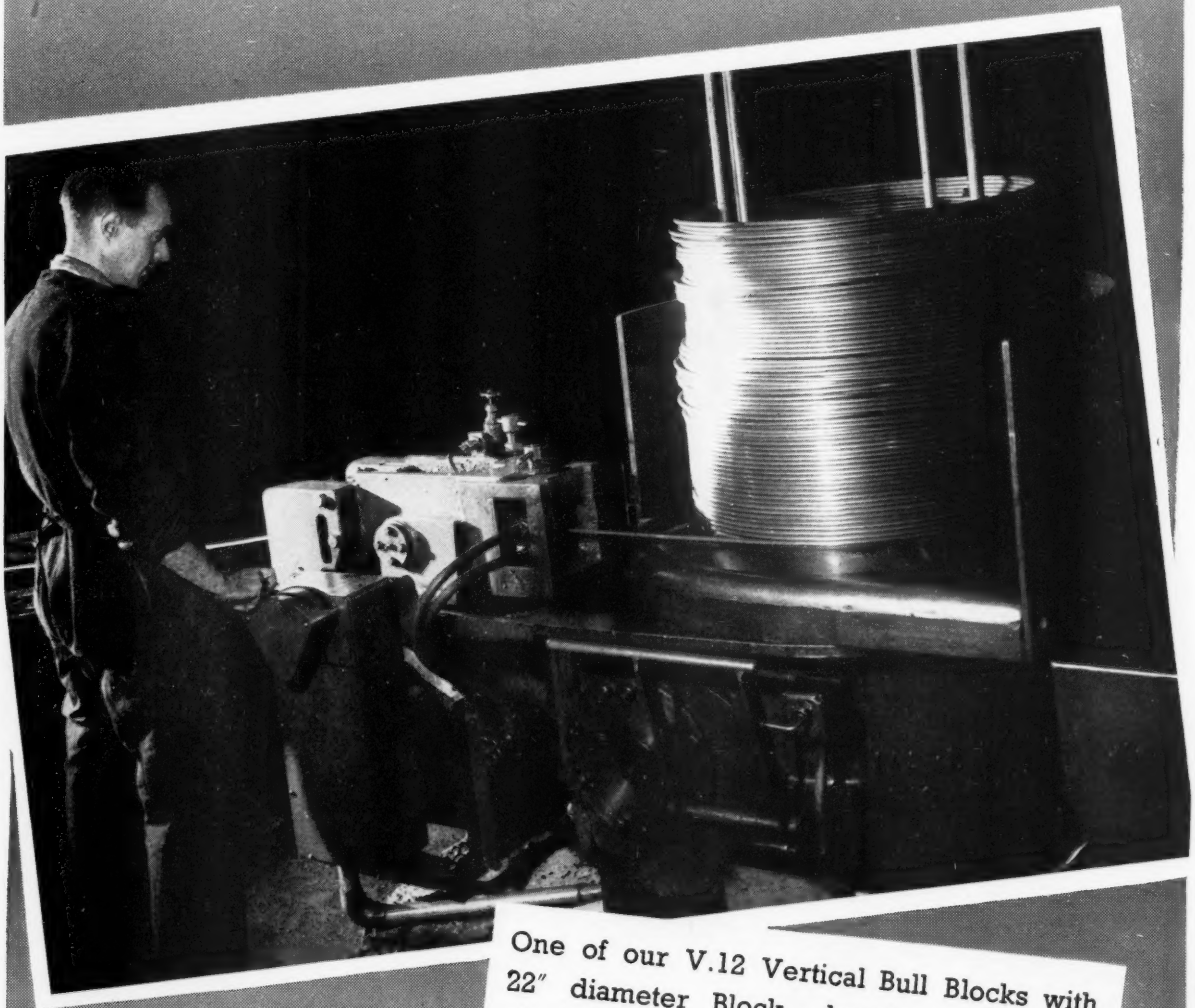
Aircraft Rivet Wire



One of our V.12 Vertical Bull Blocks with 22″ diameter Block, drawing light alloy rivet wire. Note the use of joystick speed controller which gives our machine the required flexibility for dealing with this type of production.

By courtesy of the Aluminium Wire and Cable Company, Swansea.

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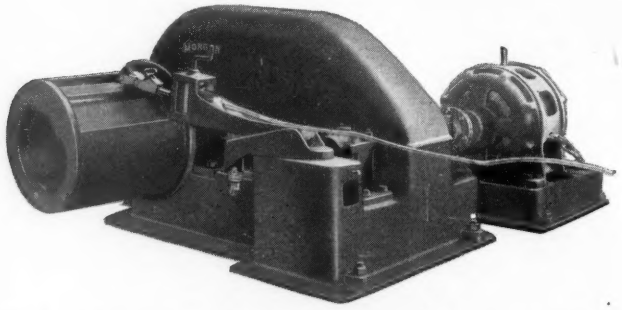
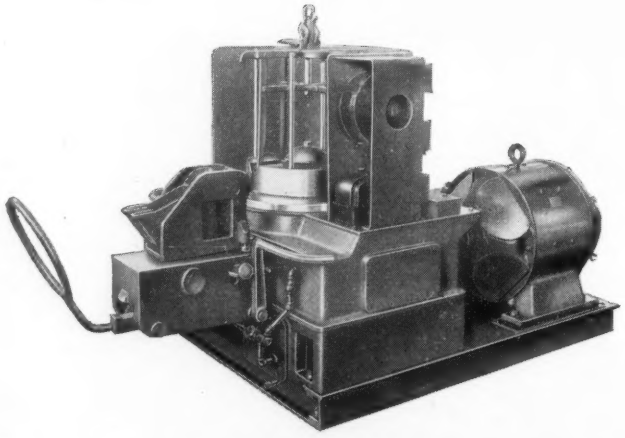
MR81

MORGAN WIRE BLOCKS

Morgan offers a complete line of single block, vertical and horizontal spindle wire drawing machines in addition to the full line of Morgan-Connor multiple block continuous wire drawing machines.



The machine above illustrates Morgan Horizontal Bull Blocks—recommended for heavy duty, single draft work. They are suitable for sizes up to one inch diameter and equivalent sections in rounds, squares, hexagons and other shapes.



The Morgan Vertical Wire Block illustrated above is recommended for lighter work. It is built in several sizes, with various block diameters and speeds.

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DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 28 MARCH, 1953 No. 3

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Contents

Editor's Desk 255

Tension Considerations in Spooling Enameled Wire
by Richard Bliss 257

Valley Wire Mill Modernizes Annealing Practice
by Edmund D. Sickels 264

Solubility of Carbon
by S. J. Rosenberg and C. R. Irish 266

Research and Engineering Progress in 1952 267

Unique Non-Rotating Single Block Coiler and Non-Rotating Multiple-Block Takeup for Continuous Wire Processes
by N. M. Hudak 269

Chart for Calculation of Braided Shields
by C. A. Alm 271

Wire Association Spring Meetings
Trenton Meeting 268
Montreal Meeting 274

Government Wire Production Information 275

Outstanding Personalities of the Wire Industry 283

A Review of Recent Wire Patents 287

Index to Advertisers 320

Where-to-Buy 321-324

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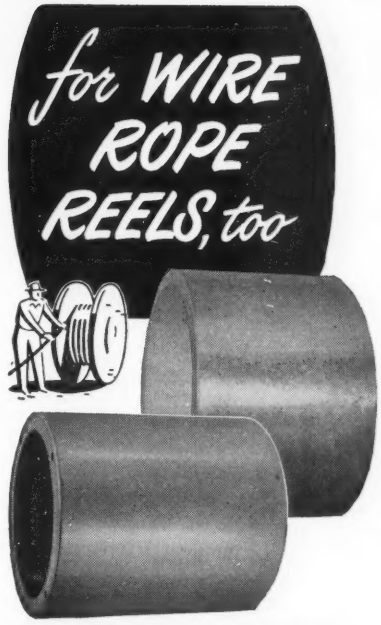

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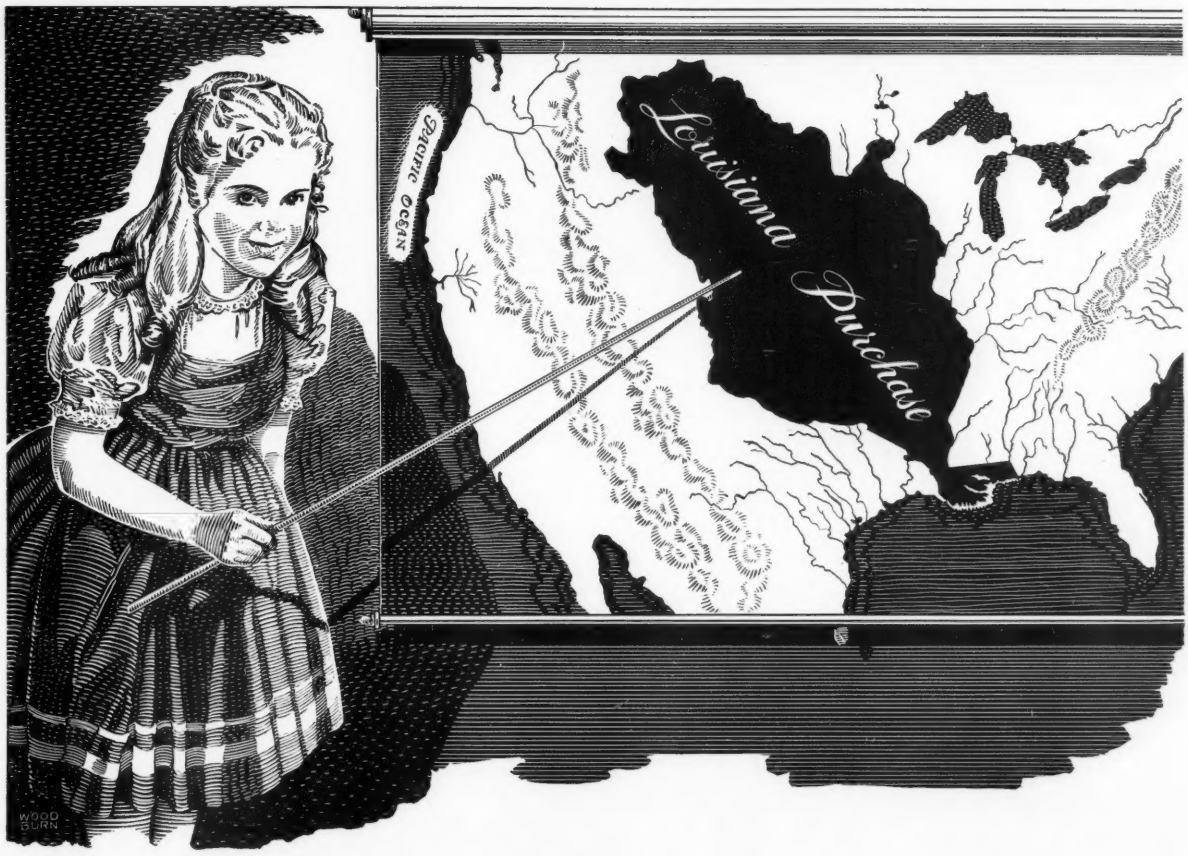

The New Louisiana Purchase

EVERY day America crosses a frontier—the frontier of a new market. It is the market created by an ever growing population. Since Pearl Harbor, our population has increased 23½ millions—more than all the people now living in the region west of the Mississippi once called the Louisiana purchase, that vast billion-acre area which provided us with geographical frontiers for a hundred years.

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There are those among us who say a decline in government spending will bring depression. But where is there room for depression when we add the population of another Minnesota or an Iowa to our nation each year—when the need for goods and services increases steadily? In fact, only by tapering off our vast programs of government spending can industry and business hope to provide sufficient goods to maintain our present standard of living and satisfy the demands of our ever growing population.

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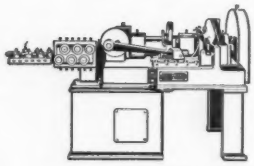
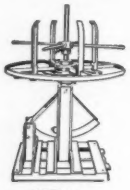
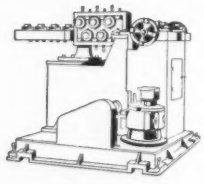


SLIDE FEED STRAIGHTENERS



REELS



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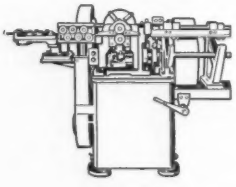
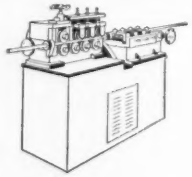


FLAT STOCK STRAIGHTENERS



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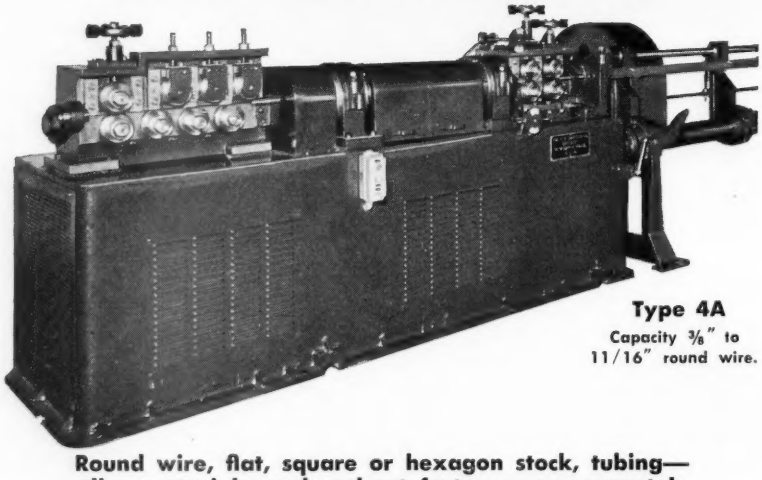

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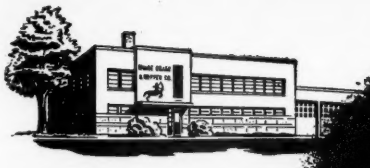

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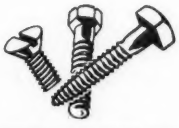

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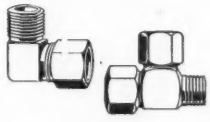

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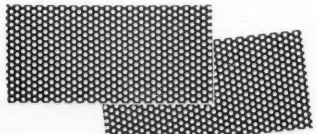

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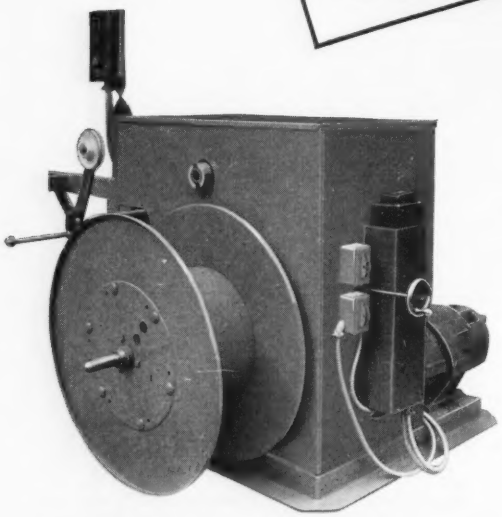

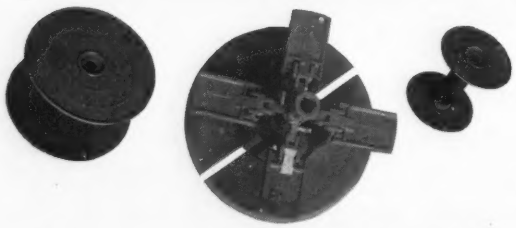

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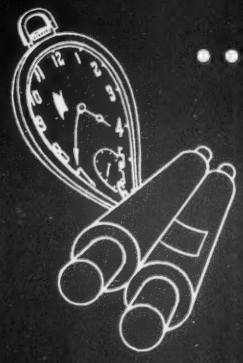
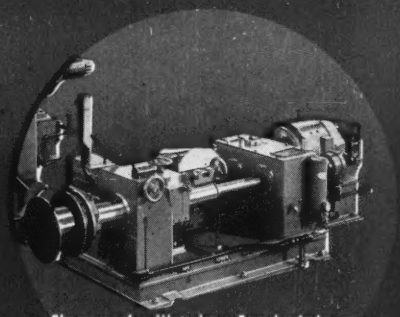
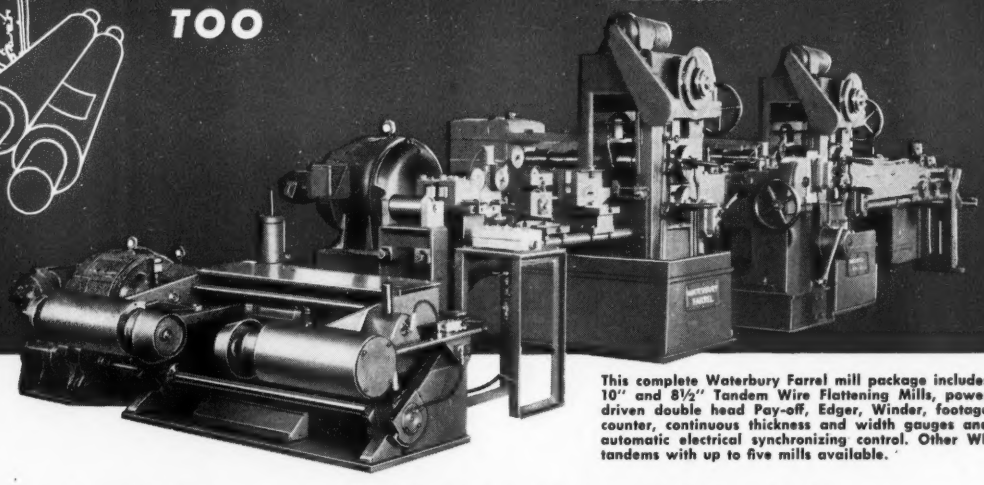




Close-up of a Waterbury Farrel winder at the delivery end of a WF Tandem Mill. Winder is provided with pneumatic clamping of reels. It has three adjustments for width of wire and width and positioning of drum or spool.



This complete Waterbury Farrel mill package includes 10" and 8½" Tandem Wire Flattening Mills, power driven double head Pay-off, Edger, Winder, footage counter, continuous thickness and width gauges and automatic electrical synchronizing control. Other WF tandems with up to five mills available.

Modern Waterbury Farrel Mill Design Insures High Production Plus Precision . . . Minimizes "Down-Time"

Here are some reasons why Waterbury Farrel Wire Flattening equipment can give you *more continuous,* high speed, precision production.

- Loading payoff and motor driven screwdowns for mills and edgers facilitate threading of wire with minimum effort and time.
- To protect precision operation, soluble oil is circulated internally and externally on the rolls and into coolant enclosures where wire is submerged. A refrigeration system maintains the coolant oil temperature at approximately 70° while a flotation unit keeps it clean and fresh. In addition, high speed mills also have a self-contained, automatically-filtered circulating mineral oil lubrication system for roll necks and drives.
- Transparent lucite covers at vital lubrication points such as gear cases and universal joints make it easy to check lubrication at a glance.
- Anti-friction bearings are used for all rotating members including the winder shaft. High precision antifriction bearings are used on roll necks and edger arbors. This, combined with precision fitting of component parts enables WF mills to maintain tolerances well inside commercial allowance.
- Tungsten carbide ring rolls permit rolling the toughest alloys and increase roll life.
- Electric control keeps wire tension constant. Dancer rolls are used for fine wire.

Waterbury Farrel designs and builds a wide range of wire flattening mill equipment to suit specific requirements. Various sizes and combinations of single and multiple mill stands with auxiliary equipment are available for flattening ferrous and non-ferrous wire from the smallest diameters to 1" diameter and more. Speeds range up to and above 2500 FPM.

Write for further information.

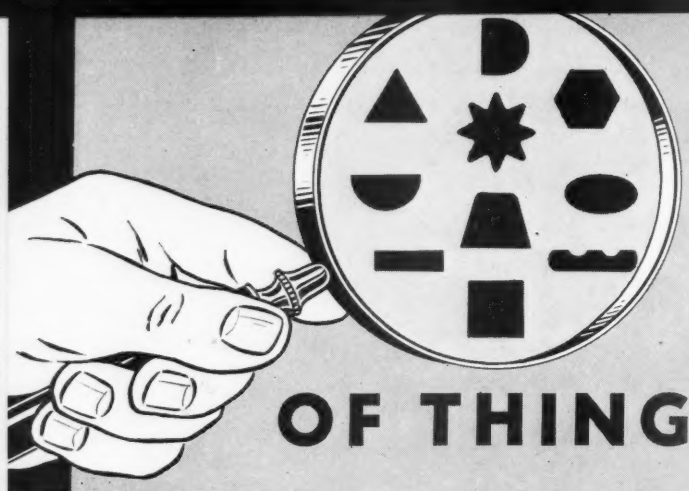
WATERBURY FARREL FOUNDRY & MACHINE CO.
WATERBURY 20, CONN.
***Sales Offices:* Chicago, Cleveland, Millburn, N. J.**

WATERBURY FARREL FOUNDED 1851

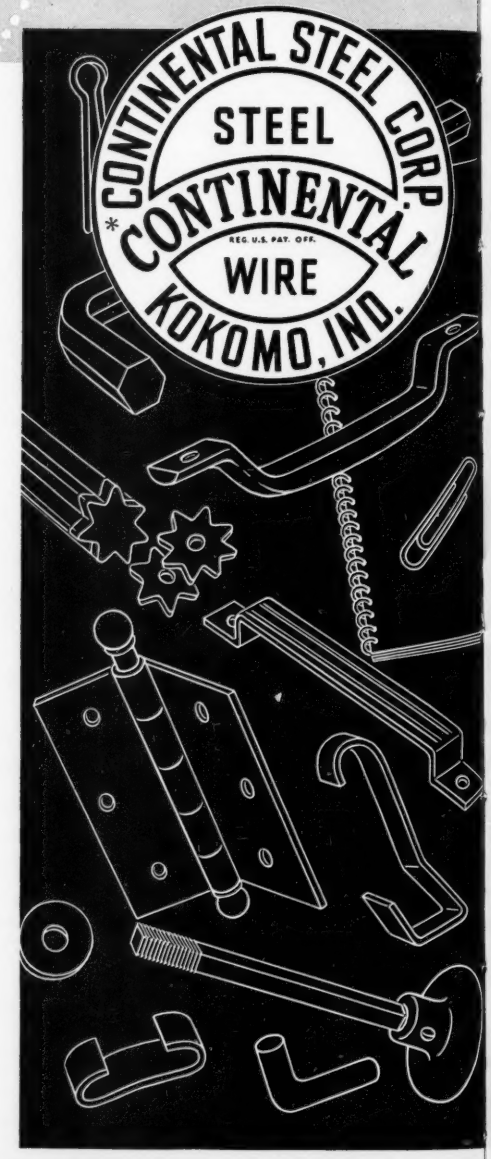
A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

MILL MACHINERY—Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. *WIRE MILL EQUIPMENT*—Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers Swagers • Bull Blocks • String-up Machines • Spoolers, etc. *COLD PROCESS BOLT & NUT MACHINERY*—Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.

WF 9



THE SHAPE OF THINGS TO COME...



Why burden yourself with production and labor problems caused by the need for machined or cast parts that may be damaged in handling . . . or in product use. You can shift these responsibilities and save money too, by using Continental shaped wire. Save the dollars you are now spending for high priced labor, throw-outs, jigs, fixtures and expensive machine tools. Continental is geared for wire production for you—producing finished, sturdy shaped wire for production parts . . . either functional or for eye-appealing trim, in practically any wire shape or size. Join the enthusiastic users of Continental wire . . . users who talk with Continental about their wire problems. Just write or wire Continental . . . without obligation, and benefit from interested, personalized wire service.

Which *CONTINENTAL Wire Shape Fits Your Current or Coming Product Needs?

Unless you check up on shaped wire you may continue to buy unnecessarily expensive forgings, stampings or rollings. Our experience with a host of wire users prepares us to help you solve your component-parts, or product-trim problems. It's easy to find out if we can be of help to you . . . just call or write us at Kokomo, Indiana.

- Small Gears
- Bright Wire Trim
- Key Wrenches
- Control Rods for Venetian Blinds
- Garment Hangers
- Stove and Refrigerator Shelves
- Buckles
- Loose Leaf Binders
- Staples
- Barbeque Grilles
- Bed Spring Border and Brace Wire
- Welding Electrodes
- Cotter Pin Wire
- Small Cams
- Costume Jewelry
- Tie Racks

*Trade Mrk. Reg. U. S. Pat. Off.

CONTINENTAL STEEL CORPORATION

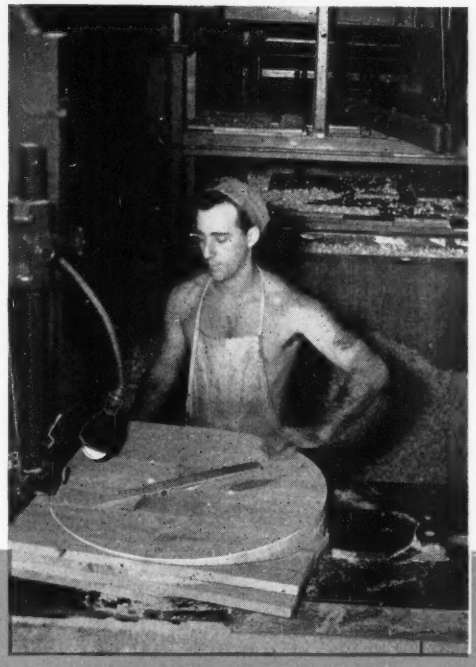
GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

ARE YOUR WOOD REELS PRECISION MADE?

Reels made by Bridge are. They're manufactured in a modern plant that is wholly devoted to making only one product—WOOD REELS.

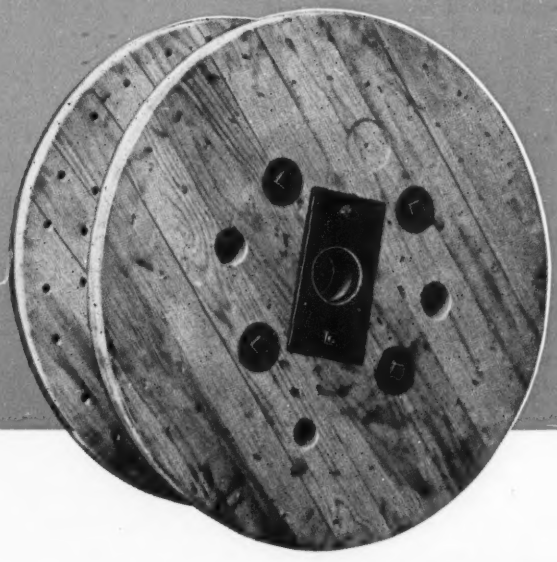
Straight-line production methods and automatic tools and jigs assure you of well and accurately made reels that conform exactly to your specifications. That's why they are of uniform high quality, as well as being low in cost. Try BRIDGE REELS!



Right: Cutting out reel head.

YOUR SPECIFICATIONS FOLLOWED

Every wire mill has its own reel specifications. Bridge's production system is designed to meet them rigidly and to furnish you with strong reels that will withstand severe handling. If you specify a delivery date—that will also be met on schedule. BRIDGE gives you what you order.



Because of the unprecedented demand for Bridge Reels, we are not at present able to give our usual prompt service to all customers. We are taking steps to remedy this situation and ask your kind indulgence meanwhile. Thank you for your patience.

PLUS A SPEEDY SHIPPING SERVICE

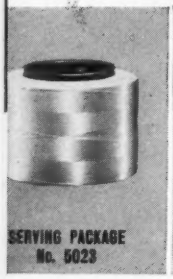
Bridge delivers by truck to your door within a radius of 200 miles from the plant. Fast freight will bring you Bridge reels in 5 days or less east of the Mississippi.

BRIDGE
MANUFACTURING CO.
HAZARDVILLE, CONN.
Phone Thompsonville, 3375

WOOD REELS FOR SHIPPING AND SHOP

12" to 96" in diameter; knocked down or assembled; returnable or non-returnable; wood heads for steel drums.

Let us quote on your reel needs. Send your specifications. Better yet, visit our plant and see how and why our reels are made so well at so low a cost.



SERVING PACKAGE No. 5023

STRAIGHT-EDGE BRAIDER No. 42

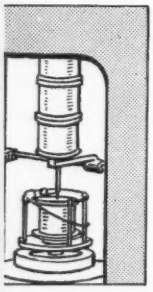
SERVING PACKAGE No. 51

STREAMLINE BRAIDER No. 43

SERVING PACKAGE No. 53

TWISTER TUBE No. 71

CONSISTENT UNIFORMITY.... a valuable feature of this VITRON GLASS YARN package



Try this Vitron package on your serving machine. You'll find each strand laid parallel and the ribbon properly spaced for fast application and a smoother finished wire.

At one glance, you can see that a great deal of care goes into Vitron packaging to maintain consistent uniformity. After use on your machine, you'll recognize the benefit to you in uniform build-up and coverage in your high speed wire processing operations.

All this great precision in Vitron Yarns starts with production of the basic glass fiber. Glass Fibers Inc. uses its own independent electronic-extrusion process to produce filaments of consistent uniformity. A variety of sizes is produced —450's, 300's, 225's, and 150's—and plied into a full range of yarns. Low twist and regular constructions are standard with Vitron. In all, Glass Fibers now prepares eleven different types of serving packages, each one designed for smoother operation in your machines.

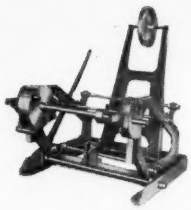
For information and samples write a note today to Glass Fibers Inc., 1810 Madison Avenue, Toledo 2, Ohio.

- *strands laid parallel*
- *smooth build of package end*
- *spaced properly for firmness*

GLASS FIBERS INC.

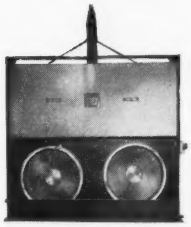
Makers of glass fibers by the ELECTRONIC-EXTRUSION process ... developed, patented and used exclusively by Glass Fibers Inc.

ON Yarns • Rovings • Micro-Fibers • Pipe Wraps • Industrial Mat • MICROLITE Thermal-Acoustical Insulation • DURAMAT r Barriers • VIBRAGLASS Machinery Mounting and Packaging Materials • COUSTIC-AIRE and THERMO-JET Aircraft Insulations.



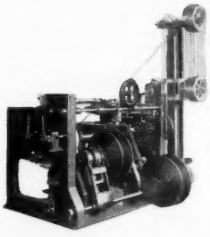
PAY-OFF

Equipped to take reels up to 36" in diameter. Cam-and-lever lift from floor. Mechanism is automatically self-braking, with brake activated by any slackening of wire speed. Rugged construction.



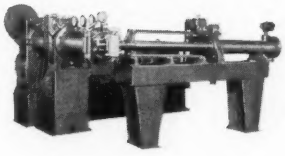
DAVIS-STANDARD CAPSTAN

Drag and pulling type. Supplies for almost all wire plant needs. Aluminum or cast iron drums, grooved or flat, in any radius desired. Gear reducers standard, four-speed transmission optional.



NEW-TYPE TAKE-UP

Great new efficiency. Quiet, vibrationless. No gears or clutches. Operates positively at high speeds. Reel drive by multiple V-belts. Automatic brake. Totally new traverse mechanism. Speed range choice for constant tension control. Built in two sizes: for reels 12" to 24" and 24" to 36".

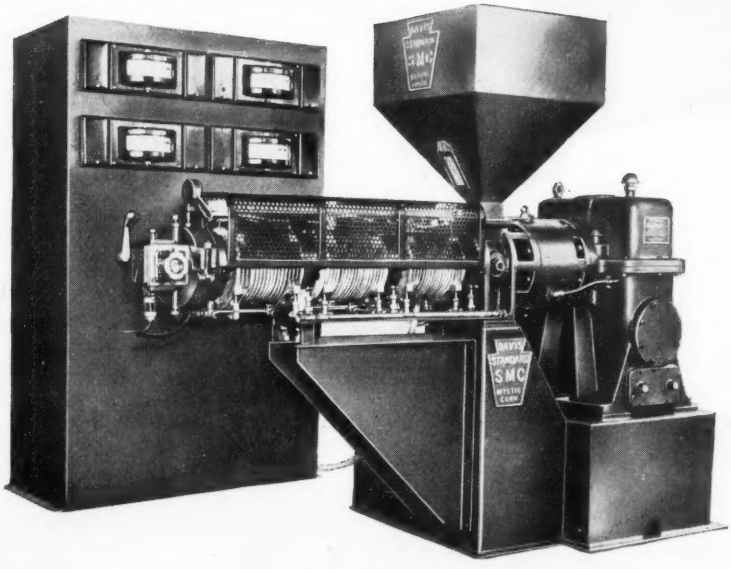


CONTINUOUS VULCANIZER

Heavy duty model assures uniform curing at high production rate. Made in 3¼", 4½", and 6" bore sizes for hot or cold fed compounds.

When is an Extruder an *Excluder*?

When it's a DAVIS-STANDARD



Let our engineers confer with yours to arrive at the soundest, most efficient installation for *your* operation.

When you purchase superior extrusion equipment, you *exclude* troubles. That's why more and more companies are installing Davis-Standard extrusion equipment. They know that it *pays* to buy extruding machines from the world's largest manufacturer of custom-made extrusion equipment for rubber and thermoplastics.

Davis-Standard extruders assure high-velocity extrusion, maximum operating efficiency, and are available with accessory units which mean satisfying, profitable production.

THE STANDARD MACHINERY COMPANY

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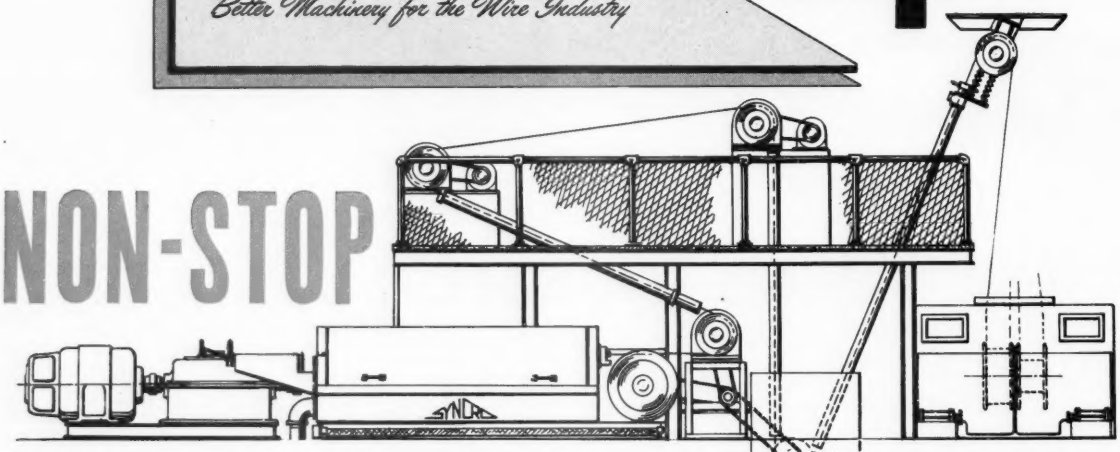
MOLDING PRESSES AND EXTRUSION MACHINES

World's Largest Manufacturers of Custom-Built Extrusion Machines

Export Office: Ballagh & Thrall, Independence Square, Philadelphia 6, Pa.

a new! angle

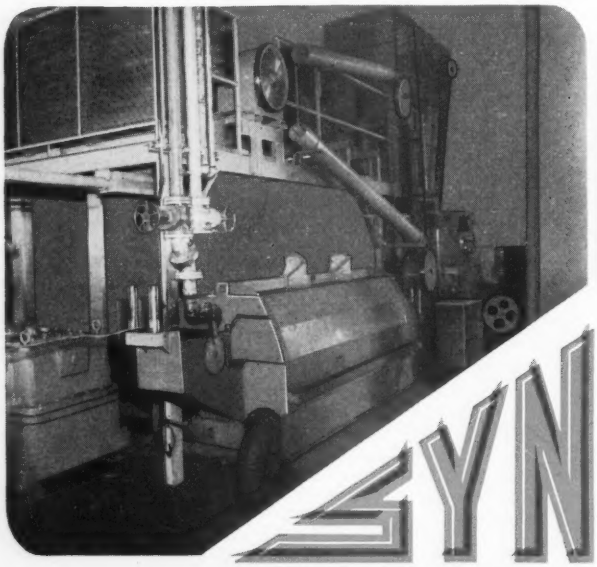
Better Machinery for the Wire Industry

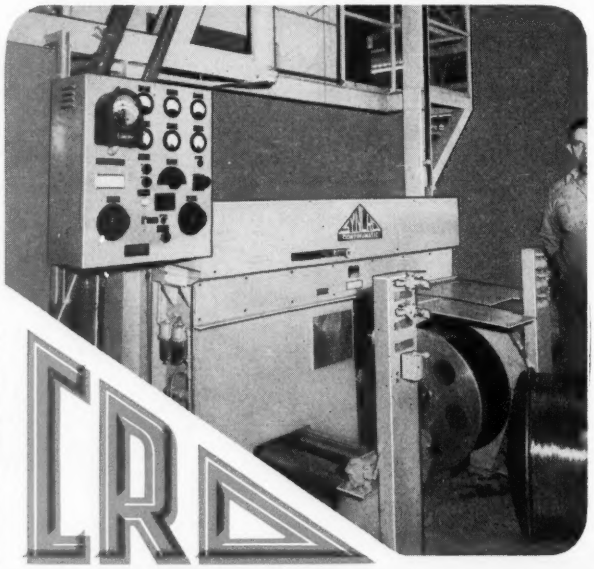


NON-STOP

copper WIRE DRAWING, ANNEALING CONTINUMATIC

and..... SPOOLING





SYNCRO

MACHINE COMPANY

PERTH AMBOY • NEW JERSEY • USA

WRITE for Technical INFORMATION

Affiliated Company
WINGET-SYNCRO, Ltd.
Rochester • Kent • England

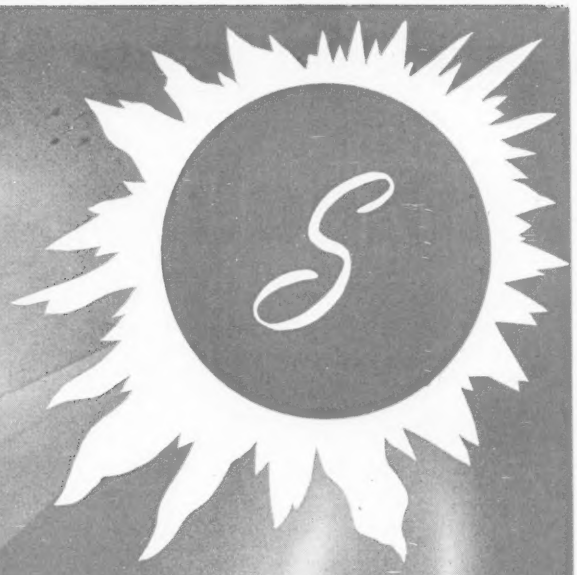
manufacturers of:

WIRE DRAWING MACHINES • STRANDERS • CONTINUOUS ELECTRIC ANNEALERS

PAY-OFFS • HEAVY DUTY TAKE-UPS • WIRE INSULATORS • SPECIAL MACHINERY

STAYS BRIGHT AS DAY ! WITH

STANDARD'S BRIGHT WIRE COMPOUNDS



STANDARD INDUSTRIAL COMPOUNDS COMPANY has pioneered most of the outstanding contributions to better wire drawing through better lubricants. Consult with **STANDARD** for the solution of your difficult problems. We welcome your inquiries.

STANDARD WIRE DRAW NO. 15

A new and different Compound for wet drawing, made from new and different materials that have a natural affinity for metals, a natural wetting-out characteristic, without the addition of a wetting agent.

Protects the wire from oxidizing for considerably longer periods than conventional compounds. Preserves the bright finish on copper coated or liquor finished wire and prevents tarnish on copper or brass wire for longer periods of time.

Below are some of the advantages of this compound:

A. Small amounts needed. Due to the natural affinity for metal small amounts of this compound are needed. Draws high carbon wire at high speeds with a fat content as low as .30 per cent, because of this affinity for metal and the natural wetting-out characteristics.

B. Low pH value.

C. Protects steel wire from rusting and copper coated and liquor finished steel wire from oxidizing. Protects copper and brass wire from tarnishing.

D. A clean compound. Keeps equipment clean and drawn wire has a clean finish.

Contact one of our representatives below or our home office for details on this new compound and a sufficient quantity for test will gladly be furnished.

Bruce W. Siemon
2400 Morrow Pl.
Pittsburgh 34, Pa.

John A. Moritz, Jr.
4600 W. Ferdinand St.
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Earl A. Bowers
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Standard Industrial
Compounds Co.
Millbury, Mass.
Arthur J. O'Mara

wire drawing lubricants *Standard* INDUSTRIAL COMPOUNDS CO., INC.

4600 WEST FERDINAND STREET
CHICAGO 44, ILLINOIS

Fastest Process Annealing FOR COILED STEEL WIRE

- ✓ Annealing cycles accomplished in minutes rather than in hours
- ✓ 50% lower equipment cost
- ✓ less floor space
- ✓ no scale, decarburization, or other atmosphere effects

On-the-job production figures prove that no other method compares with an Ajax Electric Salt Bath Furnace in speed, uniformity, cost saving, and general all-around efficiency in process annealing all types of steel wire as well as aluminum, copper alloys, and silver alloys.

Heating cycles are far faster. Absolute uniformity is assured. Thanks to the exclusive Ajax electrodynamic stirring action, the temperature does not vary more than ±5°F. *in any part of the bath.*

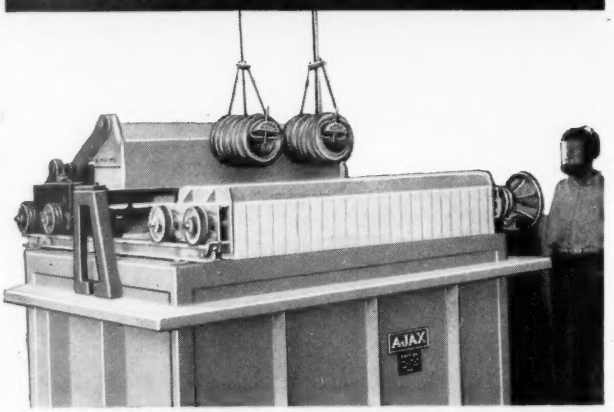
The Ajax Salt Bath eliminates all atmosphere with its accompanying problems of oxidation, pitting, and decarburization. Preservation of metal surface is assured. Equipment cost is much lower —and the Ajax handles more work for a given amount of floor space than any other method. Ajax Reprints 62 and 63 gladly sent on request.

LOW- AND HIGH-CARBON STEELS

This typical Ajax installation process anneals 1200 lb. 18-gauge wire an hour in only 58 feet of floor space.

STAINLESS STEEL

Annealing fine gauge nickel-chromium wire at 1950°F. Clean wire surface eliminates conventional pickling operations.



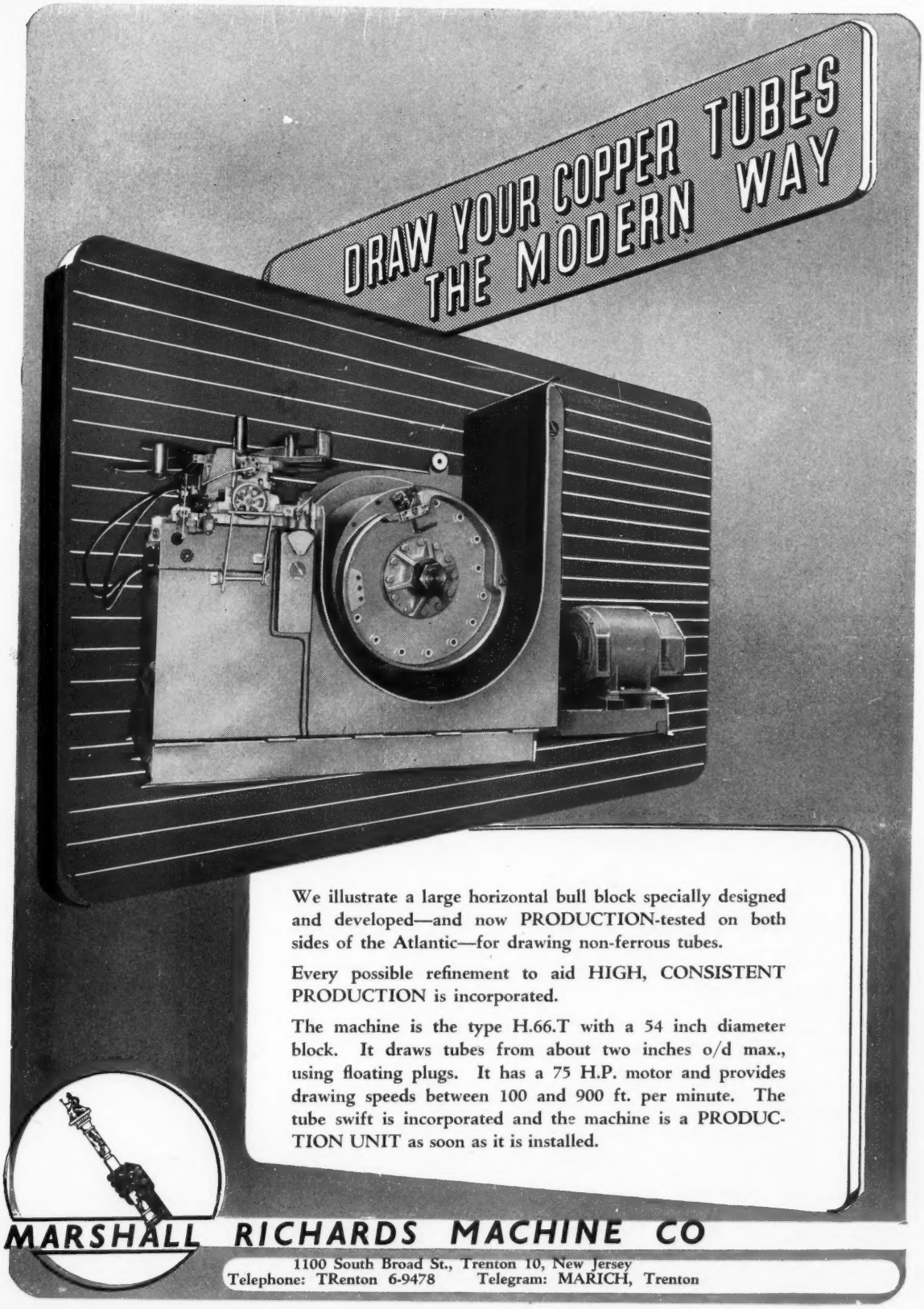
- **TOPS for WIRE PATENTING, too!**
- **IDEAL FOR DESCALING** hot-rolled stainless and alloy steel wire and other shapes employing either the Dupont sodium hydride or the Hooker Electrochemical Virgo bath.

Associate companies: Ajax Electric Furnace Corp. • Ajax Engineering Corp. • Ajax Electrothermic Corp.

AJAX electric SALT BATH furnaces

OVER 4,000 INSTALLATIONS . . . more than all other salt baths combined

AJAX ELECTRIC CO., INC., 928 Frankford Ave., PHILADELPHIA 23, Pa.



We illustrate a large horizontal bull block specially designed and developed—and now PRODUCTION-tested on both sides of the Atlantic—for drawing non-ferrous tubes.

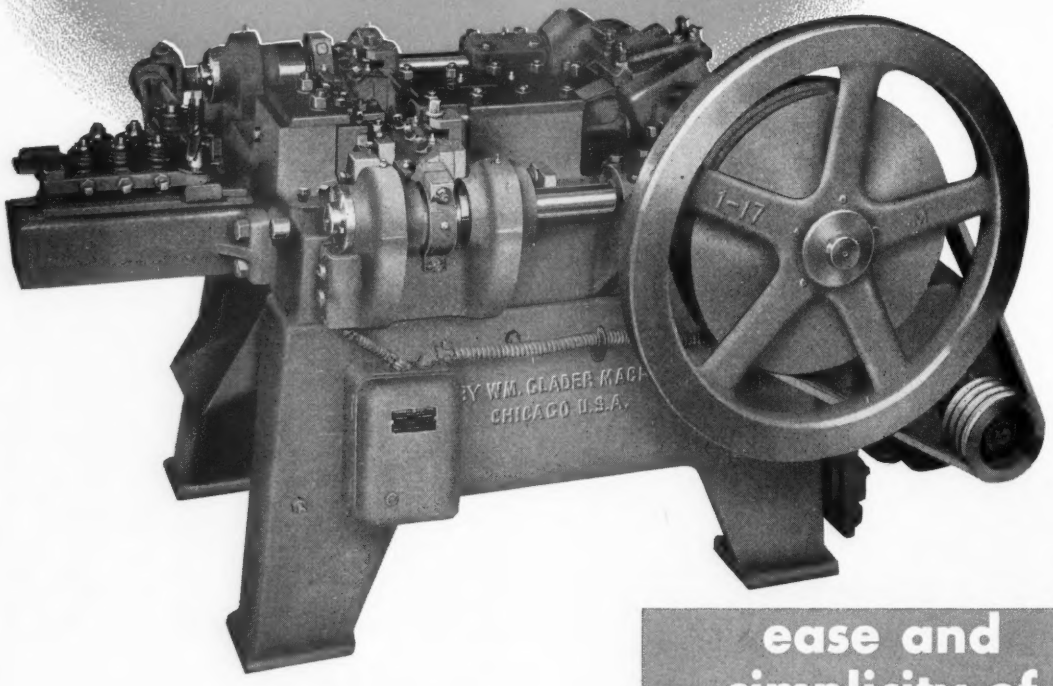
Every possible refinement to aid HIGH, CONSISTENT PRODUCTION is incorporated.

The machine is the type H.66.T with a 54 inch diameter block. It draws tubes from about two inches o/d max., using floating plugs. It has a 75 H.P. motor and provides drawing speeds between 100 and 900 ft. per minute. The tube swift is incorporated and the machine is a PRODUCTION UNIT as soon as it is installed.

MARSHALL RICHARDS MACHINE CO

1100 South Broad St., Trenton 10, New Jersey
Telephone: TRenton 6-9478 Telegram: MARICH, Trenton

years of proven performance



ease and simplicity of adjustments

NAIL MAKING MACHINES

that have proved their value through years of dependable service.

With eleven sizes and types of GLADER machines available, nails are made with maximum efficiency.

For further information write for bulletin covering this equipment.

WM. GLADER MACHINE WORKS

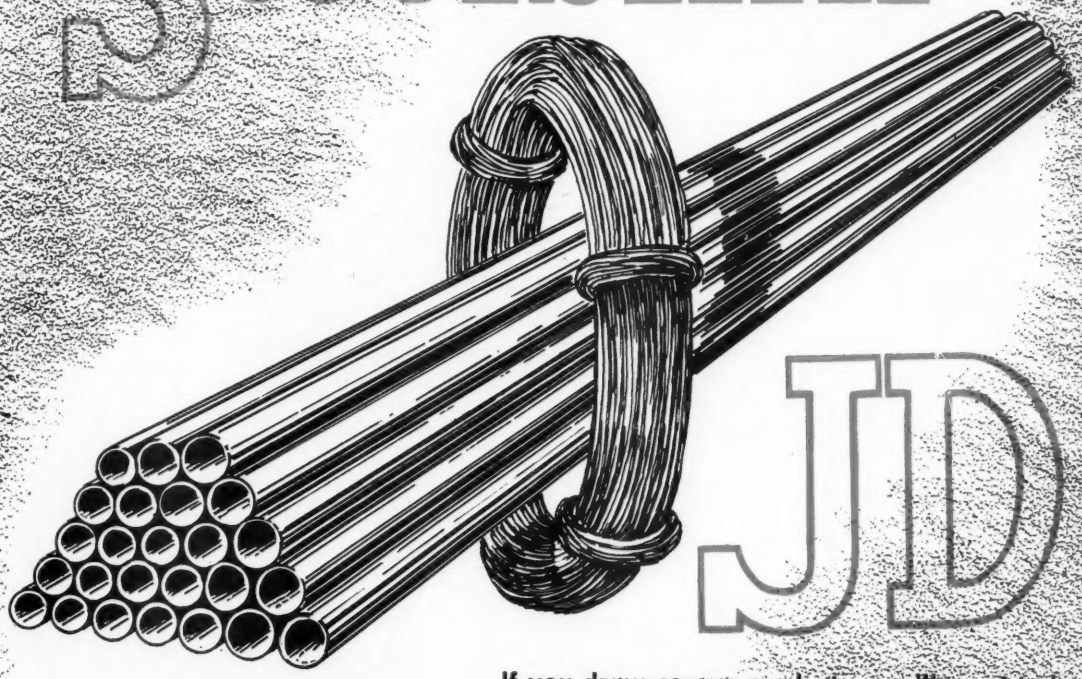
210 N. RACINE AVENUE • CHICAGO 7, ILLINOIS

EXPORT DEPT. 122 EAST 42ND STREET • NEW YORK 17, N.Y.

NEW

For drawing COPPER and COPPER-COATED wire and tubing . . .

Steelskin



J D

If you draw copper products, you'll want to know more about STEELSKIN J. D. Satisfied users of this new Steelskin Product include such companies as Chase Brass and Copper Co. and General Cable Company.

Write today for further information on Steelskin J. D.

Steelskin LUBRICANTS

R. H. MILLER

Company, Inc., Homer 1, N. Y.

HERBORN

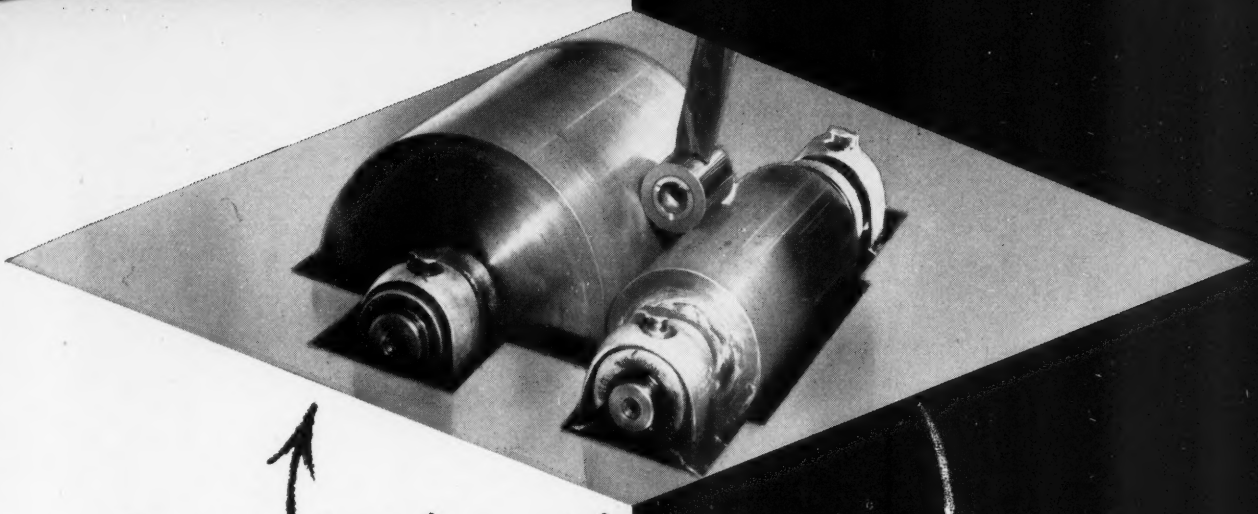
NON-SLIP CONTINUOUS WIRE DRAWING MACHINE, MODEL G. M. I., straight pull, without upper by-pass, suitable for drawing high quality steel wires of .354" maximum.

We construct wire drawing machines performing all kinds of drawing operations. We are always ready to advise you on all further details.

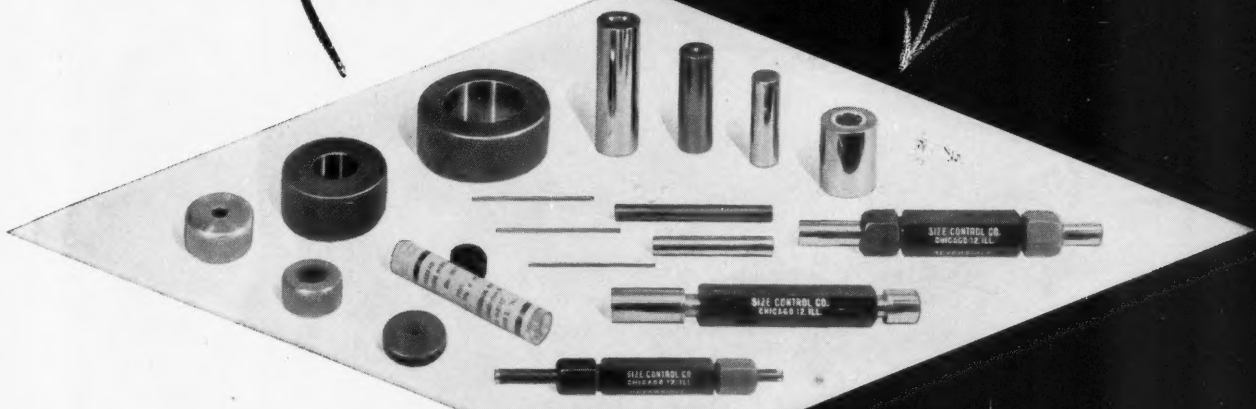
MASCHINENFABRIK HERBORN BERKENHOFF & DREBES A.-G.

Our speciality: Machines for wire industry **HERBORN** (DILLKREIS) Germany

Representative of our products in the U.S.: Kurt Orban Company, Inc.
205. East 42nd Street, New York 17, N.Y — Phone: Murray Hill 4-7700



Precision finishing with a Precision Abrasive



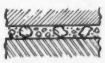
At the Size Control Company ... Chicago, Illinois

Precision gage production
presents a difficult finishing problem.
A fine, long wearing finish must be achieved just
as the piece is brought to exact size—there is no excess
material left for refinishing if a scratch develops. Only the finest, most
reliable abrasives can be used. That's why, at Size Control Company, they...

Finish with Diamond ... ELGIN Diamond!

ONLY ELGIN DIAMOND IN DYMO

is precision graded right in the Elgin laboratories



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ABRASIVES DIVISION

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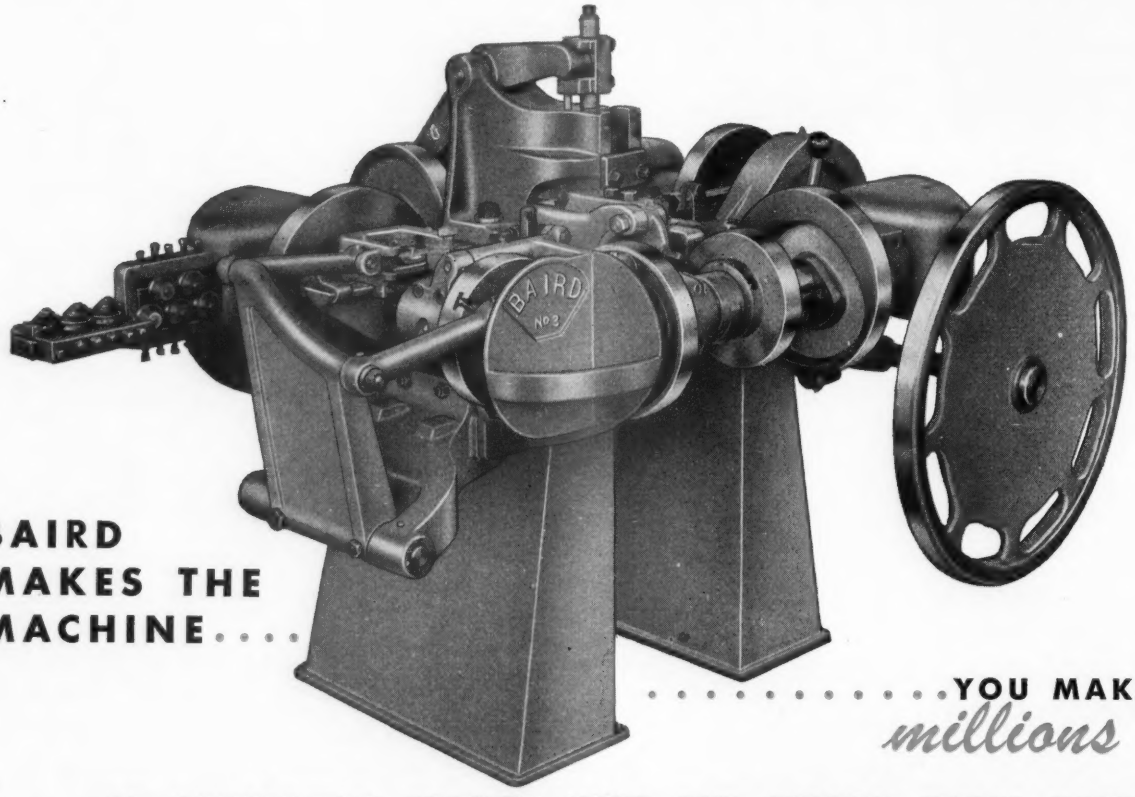

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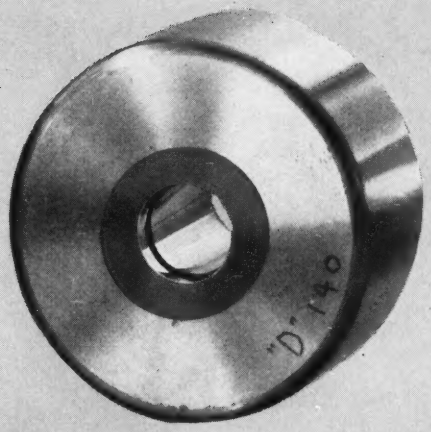

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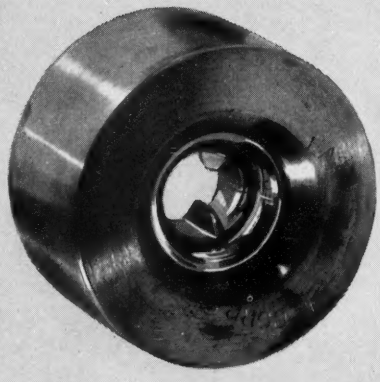

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The Wire Outlook

Business is continuing to maintain high levels of activity with no indication that it will deviate for a few months at least. The demand for consumer durables has strengthened and manufacturers, with more steel available, are boosting production schedules. All of this creates a greater demand for wire for bolts, nuts, rivets, springs, electric wire and the like.

There is an air of good feeling about our new president and the great majority wish him well—even in Congress, where little cynicism and partisan mumbling is heard. His term has started auspiciously with the formulation of definite policies and the beginning of sorely-needed budget trimming and departmental reorganizations.

Business will no longer be considered a necessary evil, but a desirable means to many ends—making products, rendering services, providing jobs and forming the base of a sound economy in which to work and live. Profits are to be regarded as good and natural—a motive that makes men strive to achieve. Besides which, our president, while the arming process continues, will attune thinking and actions to the establishment of peace.

In fact the whole world needs peace and a more free interchange of goods. Just take a look at our own wire industry and note on how many raw materials we are dependent from other parts of the globe. We import the following percentages of these products, according to a recent DPA bulletin; asbestos—95%, bauxite—65%, chromite—99%, copper—35%, industrial diamonds—100%, iron ore—8%, lead—45%, manganese 90%, nickel—99%, tin—100%, tungsten—52% and zinc—35%.

In 1952 the steel industry spent over 1.1 billions for expansion and improvement; this year another billion will be spent for the same purpose. These expenditures are expected to add another 9 million tons to our capacity by the end of the year. 1952 capacity was rated at 117.5 million tons.

Copper wire concerns are experiencing a boom and output is more nearly in balance with orders than last year. Deliveries on high voltage cables are running about five months on the average. Building wire demand is good, though such wire is readily available. Some slack has been noted in magnet wire. Electric wire wholesalers are carrying light inventories and depend on mills to fill orders quickly when large orders materialize. ACSR wire is plentiful now, because of the larger number of concerns making it.

Upholstery and automotive wire is in heavy demand and high carbon wire orders are keeping production schedules filled. Manufacturers and cold heading wire deliveries are running a little behind due to demand. Orders for wire for BX cable has slackened, but this is expected to pick up with the resumption of building in the Spring.

Decontrols have come about for many products, but some, like copper, nickel, tungsten and cobalt will continue to be considered critical materials. Aluminum is still in short supply—but not for long.

Congress seems eager to cut taxes now and individuals will have the inside track, with probably a 10% cut starting July 1st. At the same time the excess profits tax on corporations will expire and will not be renewed. This will necessitate operating the Federal government in the red until our sprawling bureaus can be reorganized and trimmed down both in personnel and activities.

The withdrawal of price and wage controls is not expected to have a noticeable effect except in previously unadjusted wages, but these increases will probably be moderate this time. In the process of securing them, however, there may be many strikes. We had no real wage control under the previous Administration as every demand from a large labor organization was consistently approved.

It is said that the Kremlin is experiencing an internal crisis while awaiting one in capitalism. We hope fervently that it is so. The world needs a breathing spell.

—from the Editor's Desk

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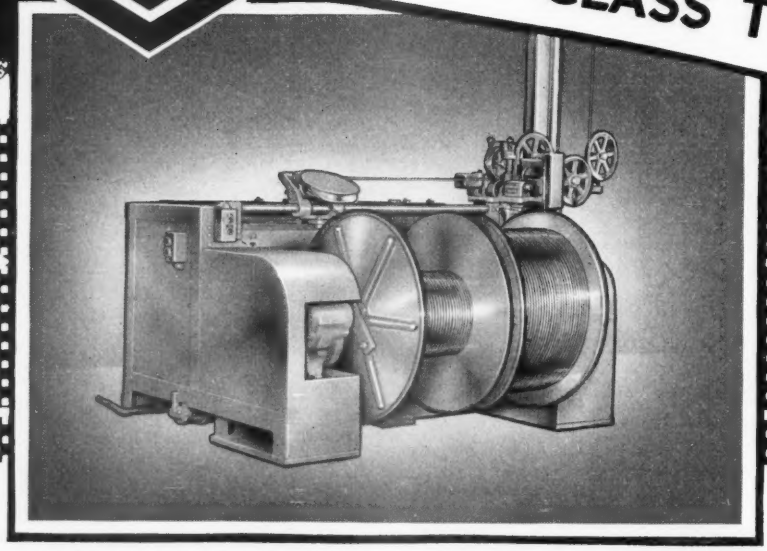

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See Page 289 for a complete listing of JLE Products for the Insulated and Bare Wire Industry

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Vol. 28 MARCH, 1953 No. 3

Tension Considerations in Spooling Enameled Wire

by Richard Bliss
Industrial Heating Department
General Electric Company
Schenectady, New York

In this article Mr. Bliss gives some practical advice on how to keep enameling costs at a minimum and to produce more uniform and satisfactory enameled wire.

Thousands of dollars can flit out of your enameling profits if wire tension is not properly specified and maintained.

★ ★ ★

Too often, tension is either improperly evaluated, or ignored altogether in specifications for wire spooling equipment. As a result, the equipment manufacturer must rely on his own judgment in designing properly sized machinery to fit the spooling application. Often enough to make it matter, he does not have a sufficiently intimate knowledge of the spooling application details to make the best possible decisions for the design of the apparatus. The result can be expensive if the equipment is overdesigned and it can be disastrous if the equipment is underdesigned.

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There is no monopoly on tension. Certainly the wire manufacturer should know the limitations of his product in regard to tension considerations. The equipment manufacturer must know the tension involved so that he can build the machine to do the job it is supposed to handle. The fellow who uses the finished wire is also in on the problem. For he is the one who has to get the wire off the spools in the manner and condition that he can use it. From these three sources, each working together with the others, must come the proper evaluation of tension for any enameled wire spooler application.

★ ★ ★

There are several ways of looking at tension. Basically there can be either too little tension, too much tension, or just the right amount of tension.

★ ★ ★

Suppose that your spooling tension is too low. Finished wire spools come off the spooler in a loose or "spongy" condition. This in itself may not be too bad at the moment. But let these spools be transported any distance by rail or truck. Then the loose wires will jiggle and shift and loosen up still further until the individual loops become entangled with each other. In this condition, it is impossible for wire to be drawn off the spool.

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Suppose that your spooling tension is too high. Then the individual strands jam into each other until snarls occur and, again, wire cannot be easily taken off the spool. Often high tensions will neck down the wire, until the diameter is reduced, deforming the enamel insulation coating. Excessive tension will also destroy the anneal, if any, of the material by work hardening.

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The goal is to have your tension just right. It is most gratifying to see properly wound spools come off the winding machine. Each package has the maximum amount of wire wound on it. The condition of wire winding is such that it will withstand long distance shipping without loosening and snarling. The wire itself is in the best of physical condition. Instead of manufacturing losses and rewinding charges, you will find that you have a better product in a

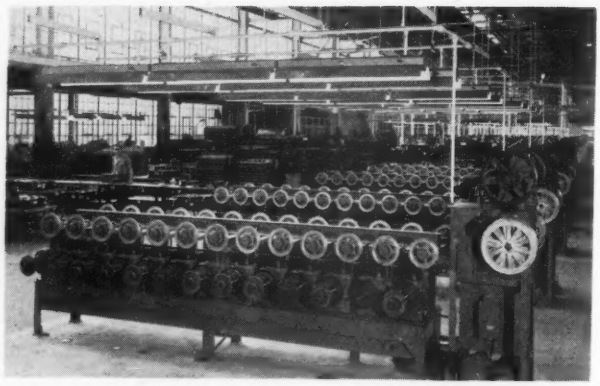

Figure 1. Wire spooling equipment for Type M Wire Enameling Equipment. Wire spooler unit is at the left and capstan unit on the right. Each spooler spindle is powered by DC torque motor. Tension is controlled on all motors simultaneously by varying spooler motor voltage with generator field control. Spooler control generators are located in the bottom of the capstan unit. Capstan speed is regulated by Thy-mo-trol* drive.

* Reg. Trade Mark of the General Electric Co.

better package. Tension means dollars in equipment costs, as well as in operational costs and losses.

★ ★ ★

For instance, take an electric torque motor spooling machine such as is shown in Fig. 1. The physical size of a machine of this sort is determined basically by the power requirement of the spooling application. Horsepower here is determined by the formula:

$$\text{Horsepower} = \frac{\text{wire tension x wire speed}}{\text{33,000. x Efficiency}}$$

Since wire speed is usually set by the requirements of the process, the effect of tension is immediately apparent. If the tension is erroneously specified at double its true value, then the horsepower is doubled and your machine is twice as big as it need be, and probably about 60% more expensive. Halve your tension specification and the machine will not do the job for which it was intended.

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Tension becomes an important factor in the design of mechanical drive spooling machines. In a typical machine, such as is shown in Fig. 2, power is transmitted to the spool through a pair of friction discs, one slipping against the other. Here the size of the friction drive, and, ultimately, the entire machine, depends on the power to be transmitted from the main driving shaft to each individual spooler spindle. A friction drive such as this, if underdesigned, will produce an intermittent, grab and slip, type of power transmission with a resulting amount of high wear and maintenance on the friction components. If overdesigned, such a drive may not have enough minimum torque transmission to handle the wire sizes over the range for which the machine was designed.

★ ★ ★

Spooler machines for enameling equipment are designed for relatively small ranges of wire and spool sizes. For instance, it is economically and technically unsound to attempt to run .010″ diameter wire on a machine designed for .072″ diameter wire, or vice versa. On electric motor drive spoolers for larger sizes of wire, torque motors operating through gear boxes are used to power the spool during winding. The rectangular wire spooler shown in Fig. 3 is a typical example. For large rectangular wire, the tension must be carried quite high and the speed very low. The motor power must be converted to high torque by the

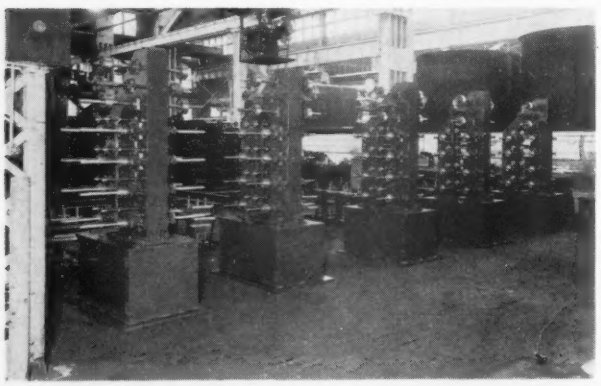

Figure 2. Mechanical drive type wire spooling equipment for Type I Wire Enameling Equipment. Spooler spindle, capstan, traverse driven from same drive motor located in base of machine. Tension regulated by individual adjustment of spring load friction discs in each spindle.

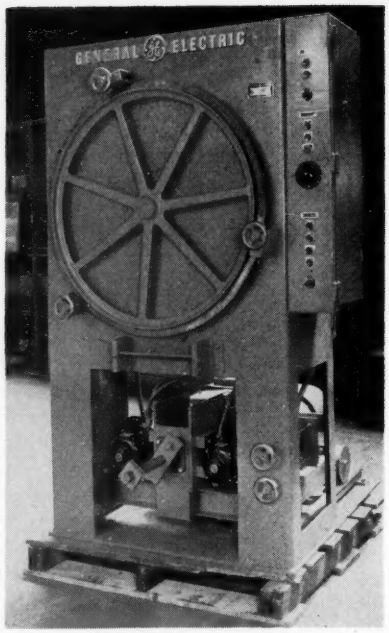

Figure 3. Rectangular wire capstan and spooler unit. Capstan is fleeter ring type powered by Thy-mo-trol drive. Spooler spindle driven by either one of two AC torque motors, one having a different gear ratio than the other. Tension is controlled by regulation of AC voltage from large knob on control panel on right side of machine. With two motors, an exceptionally wide range of wire sizes can be accommodated on one machine. Spool is traversed back and forth by Thy-mo-trol drive controlled automatically from spooler spindle speed.

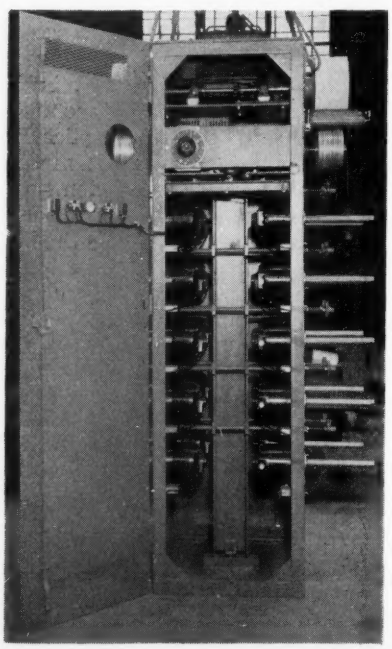

Figure 4. Interior view of capstan and spooler unit for Type I Wire Enameling Equipment. Each spooler spindle is powered by an AC gearless torque motor. Tension is adjusted simultaneously on all spindles from variable voltage source controlled with large knob and dial on cross piece. Capstan speed is set by Thy-mo-trol drive.

gear reduction between the motor and spooler spindle.

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For small sizes of wire, a gearless motor may be used as shown in the interior view of the spooler in Fig. 4. Here the application requires a low tension and higher speed coupled with the low inertia characteristics of the gearless motor drive.

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Somewhere, in ascending the table of wire sizes, there is a point where the equipment designer must swing from a gearless drive to a geared drive. This is a critical point where it is most important that tensions be accurately specified. For copper magnet wire for enameling applications, this critical point is in the range of .0159" to .0201" diameter wire. These sizes are best handled by a gearless motor but sometimes they can be and are spooled with a gear motor, depending on certain conditions. Size of spool, speed, and condition of wire may dictate the choice of one of the other type of drive.

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The danger here is that the starting torque needed to overcome internal gear box static friction in the gear motor may result in too much tension for the wire to stand once the drive is rotated. Excessive breakage will then occur. A very careful analysis of tension is needed to produce a satisfactory drive in this range.

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Generally, it can be expected that the cost of a geared down spooler drive, on a per spindle basis, will run from two to three times the cost of a gearless motor spooler drive. Obviously, it is in the equipment users' interest to know his tensions accurately so that the most economical machines can be furnished and used.

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These are some of the reasons to justify taking pains for accurate and realistic specification of tension. Let us examine the factors which must be evaluated in order to decide what tensions must be used. These factors might be listed as follows:

1. **Wire material**
2. **Wire dimensions**
3. **Wire surface characteristics**
4. **Wire speed**
5. **Spool size**
6. **Distributor traverse rate**
7. **Tension Variation**
8. **Ultimate destination and use**

★ ★ ★

Let us discuss these factors in order.

Tension as Related to Wire Material

As any wire man may have noticed, different materials will require different spooling tensions. The question arises, what tension shall be used with a given material?

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A listing of materials and acceptable spooling tensions with which this author is familiar is shown in Table 1. This table lists unit spooling tensions in pounds per square inch of wire cross-sectional area. The spooling tensions listed in Table 1 have been found to produce satisfactory spooling results.

TENSION DATA

Table of acceptable spooling tension for various wire materials.

Material	Condition	Tension - PSI
Aluminum	Soft	3,000
Copper	Bare-hard	10,000
Copper	Bare-soft	5,000
Copper	Enameled	5,000 - 7,000
Alloy Resistance Wire	Annealed	15,000
Steel	Low Carbon	10,000
	Music Wire	66-133,000
	Screen Wire	30- 60,000

Table I. Table of acceptable spooling tension for various materials.

In Fig. 5 acceptable spooling tensions have been plotted against the tensile strength for each particular material. It is interesting to note that the plot falls into a definite pattern. This suggests that an acceptable spooling tension for any material can be predicted knowing the tensile strength of that material. Since tensile strengths are easily determined or are generally known, both the equipment user and the equipment designer can get a good idea of what tensions are involved for a particular application.

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Table 2 lists tensile strength for some of the common metallic wire materials found in the enameled

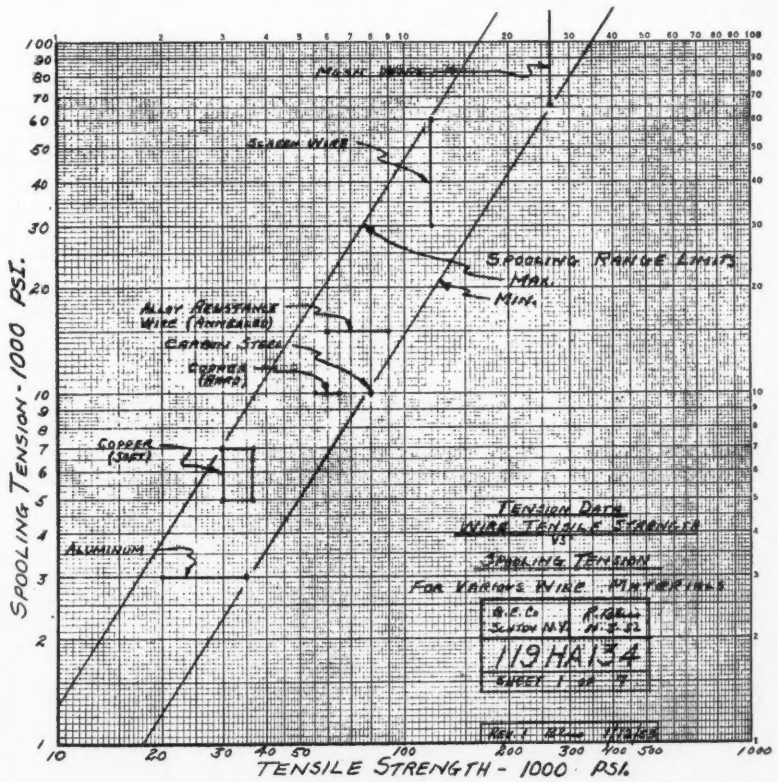

Figure 5. Variation of acceptable spooling tension for various materials compared with the tensile strength of the particular material.

wire industry.

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Often the condition of a given material, as well as kind of material, may require different tensions. For instance, annealed copper wire should be spooled at lower tension than hard copper wire. This is to prevent undue elongation of the softer wire. However, with a condition of this sort, an acceptable spooling tension can again be predicted on the basis of knowing the tensile strength of the material in the condition which is being considered.

Tension as Related to Wire Dimensions

Acceptable spooling tensions seem to vary with the size of wire. Higher unit tensions are required for finer wires than for heavier wires. Fig. 6 shows a plot of average values of tensions which were actually measured in a wire enameling plant. Note that the trend is that of a general decline in tension of about 50% over the total magnet wire range.

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Taking the maximum point of the actual values as a basis, a curve line can be determined to act as an operation and design curve for the maximum spooling tension to be used for copper magnet wire. The slope of this curve shows that advantage can be taken of the tendency for lower unit tensions on heavier wire. Thus, more economical sizing of equipment can be realized on heavier size wires than if a single spooling value had been used.

TENSION DATA

Tensile strength for various wire materials.

Material	Condition	Tensile Strength - PSI
Aluminum	Hard	30-70,000
Aluminum	Annealed	20-35,000
Copper	Hard	55-65,000
Copper	Annealed	30-36,000
Brass	Hard	80,000
Brass	Annealed	50,000
Bronze	Phosphorous	100,000
	Silicon	108,000
Chromax		70-150,000
Iron		50-120,000
Nickel		60-135,000
Platinum	Hard	53,000
Platinum	Annealed	32,000
Resistance Alloys	Annealed	60-90,000
Steel	Carbon-Hard	120,000
"	Carbon-Annealed	80,000
"	Bridge Cable	120,000
"	Screen Wire	120,000
"	Music Wire	267,000

Table II. Table of tensile strengths for various wire materials.

Rectangular copper magnet wire also shows the same tendency for lower tensions on heavier sizes. Fig. 7 shows a similar maximum design and operation curve which has been used as a design basis for successful wire spooling machines. While the two curves in Fig. 6 and Fig. 7 apply specifically to copper magnet wire, it is believed that the same trend will hold true for other wire materials. Configuration, as well as size, has an effect on spooling tension. For instance, rectangular wire can be spooled at relatively lower unit spooling tension than round wire. Fig. 8 shows a comparison of spooling tension curves for round and rectangular wire. Apparently here, as in a mechanical bending moment beam problem, the relation of cross sectional moment of inertia of area to the distance of outer fibers from the neutral axis, becomes a factor. It is believed that the relationship shown in Fig. 8 holds generally when the ratio of width to thickness is greater than 2 to 1. When this ratio approaches 1 to 1, or square wire, it is felt that the spooling tensions required will then approach the curve of spooling tensions for round wire.

Tension as Related to Surface Characteristics

The condition of the surface of the filament being wound has a definite bearing on the acceptable spooling tension. Bare wire drawn from shaved rod, free from burrs and slivers, will "lay in" better on a spool than enameled wire. Filament insulated wires, such as glass, cotton or asbestos impregnated coatings, have a roughened surface which tends to offer a greater resistance to one wire sliding over another as it is wound on a spool. This tends to prevent the wires from packing in and making a firm spool package.

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In many cases Formvar* and oleo-resinous enameled wire is lubricated with oil before it is wound. This makes the wire relatively slippery and enables it to be wound at a minimum tension. In the lubricated condition, each wire will slide easily on the coils underneath until it slips in between subsequent underlying turns to form a tight package.

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It has been noticed that dry Formvar and oiled oleo-resinous insulated wire require about 25% more tension than the same size oiled Formvar wire. Dry, unlubri-

* Reg. Trade Mark

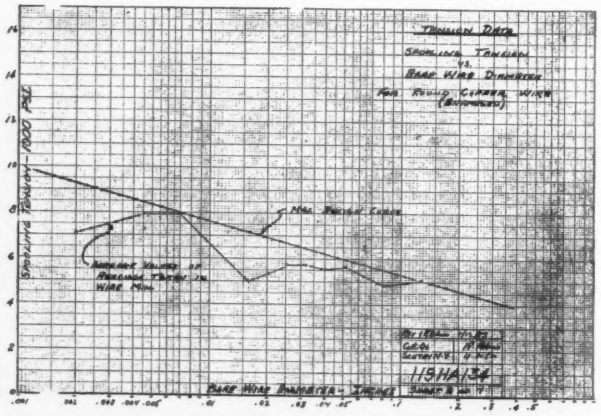

Figure 6. Maximum curve for spooling tension for rectangular copper magnet wire.

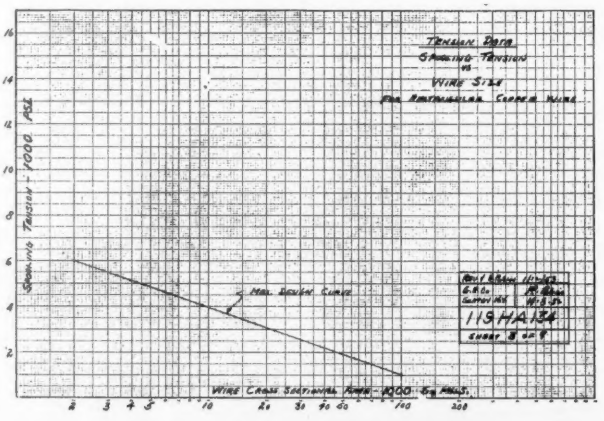

Figure 7. Average test values and suggested maximum curve for spooling tension for wound copper magnet wire.

cated, oleo-resinous insulated wire will require from 50% to 75% more tension than oiled Formvar insulated wire. It is more desirable to lubricate the wire before spooling whenever possible to gain the advantages of low tension spooling. Less damage and elongation, particularly in the case of annealed copper wire, will result and the most economically sized spooling machines can be used when low tension winding is employed.

Tension as Related to Wire Speed

As far as this writer has been able to determine, the speed the wire is traveling does not become a factor in determining acceptable spooling tension. While there is a greater amount of energy absorbed in bending the wire around the spool at high speeds, there does not seem to be any change in the tension required to bend the wire.

Tension as Related to Spool Size

In theory, it would appear that the smaller the diameter of the spool the sharper the bend of the wire around the spool would be. This would indicate that the tension required to make that bend would be greater with smaller spools for a given size wire. Fig. 9 shows that analysis of the ratio of wire diameter to spool diameter as plotted against wire size. The curve shows that the ratio of diameter to spool size decreases as the wire size increases. For the larger sizes of wire, the amount of bending around the spool is relatively greater than for smaller sizes by a factor of 12 or 13 to 1. This would seem to indicate that a relatively greater tension would be required on heavier wire than for small wire. Fig. 6, 7 and 8, however, have shown that experience indicates that the actual case is just the opposite. Larger wires take less unit tension than smaller wires. Possibly the decrease in the ratio makes the decrease in tension less of a factor than it might be if the same ratio was used for all sizes of wire.

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At any rate, it is concluded that the size of spool is not an appreciable factor in evaluation of spooling tension. This would hold true only for the range of spool sizes generally found in the wire enameling industry.

Tension as Related to Distributor Traverse Rate

Distributor traverse rate has its bearing on acceptable spooling tension.

★ ★ ★

Layer winding, with each individual turn being laid in side by side, requires the least tension. With this type spooling, each individual turn falls into its correct position easily. It does not have to be forced down or drawn harshly down between underlying turns to get a tight package.

★ ★ ★

Generally, rectangular wire is spooled in this manner, that is, with each turn being laid in carefully side by side. This may be one reason why relatively lower spooling tensions can be used for rectangular wire than for enameled wire, which case is indicated in Fig. 8.

★ ★ ★

"Random Winding" is generally used on wire enameling equipment spoolers. For this type winding, a single distributor traverse rate is used for a full range of wire sizes. Thus, the amount of advance of traverse per turn of spool varies for each size of wire. Greater tension is needed with this type wire than with layer winding.

★ ★ ★

Generally, the greater the traverse travel per turn of spool, the more tension is required. As the traverse rate goes up, the angle of cross-over of one turn upon another increases. More force is needed to tighten the wire down on underlying turns as there is less tendency for the wires to slip and slide into place.

★ ★ ★

The acceptable spooler tensions, listed in Fig. 1 were all made using a traverse rate of 2 to 5 times the wire diameter. This traverse rate seems to make it possible for the wire to be spooled at a minimum tension and with a minimum resulting "basket weave" effect and will produce good tight spools free from snarls and "stickiness."

Tension as Related to Allowable Variation

The allowable, or desirable, variation in tension during build-up of wire on the spool is generally not specified. Spooling machines can be built to wind a spool at constant tension if desired, or at a

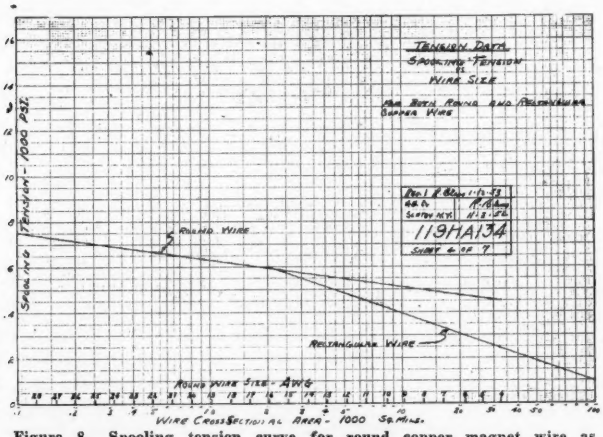

Figure 8. Spooling tension curve for round copper magnet wire as compared with that for rectangular copper magnet wire.

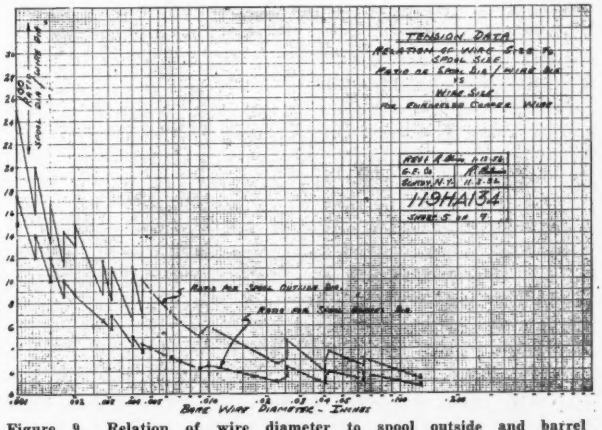

Figure 9. Relation of wire diameter to spool outside and barrel diameters as practiced in a typical wire enameling mill.

controlled variation of tension.

★ ★ ★

On mechanical friction drive, slip clutch type machines, there is a natural variation of tension inversely proportional to the winding diameter. For instance, on a spool, whose barrel diameter is ½ the outside diameter, this variation will amount to 2 to 1 or, in other words, the tension at the end of spooling will be 50% of the starting tension.

★ ★ ★

With a dancer roll, or equivalent, control mechanism, the mechanical drive machine can be made to spool at constant tension.

★ ★ ★

Electrically driven spooling machines can be built to spool wire with the same variations or the same constancy of tension variation. With both the mechanical and the electrified winding drives, the more closely the tension variation approaches a constant tension condition, the more complicated and expensive this type drive becomes. For most economical equipment cost, it is obvious that proper consideration should be given to the variation in tension as well as to the magnitude of tension.

★ ★ ★

It is believed by this writer that the most desirable condition is to have the tension fall off from 25% to 30% of the original setting during spool build-up.

★ ★ ★

Constant tension spooling tends to build up too much pressure on the interior of the wire wound on the spool. This can cause jamming of the wire underneath which will show up as "stickiness" when the wire is taken off the spool. Pressures can build up inside the spool which may be great enough to burst the spool heads from the spool barrel.

★ ★ ★

Conversely, it is felt that a 50% decrease in tension, experienced on the straight friction drive, results in too low a tension at the end of spooling. The outer layers of the spool will tend to be loose and will have a soft spongy condition which will not enable the spool to withstand long distance shipment.

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Above all, it seems to be most important that the tension does not increase above the original setting. Any increase at all should not amount to more than 5% to 10% of the original tension setting. Any increase greater than this will either break the wire, damage it beyond usefulness or result in jammed spools.

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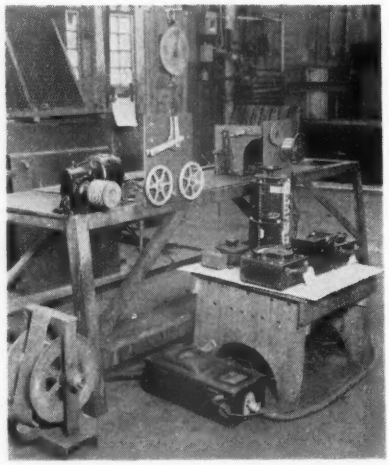

Figure 10. Layout for tension testing equipment.

Tension as Related to Ultimate Destination and User

The ultimate use and destination for the wire being wound should be considered in determining tension and tension control.

★ ★ ★

There are cases where loose winding can be and is tolerated. Such a case would be a plant where the wire mill is used to supply another segment of the same factory. With this type of user requirement, shipping distances are generally very short and even loose winding will withstand transfer from one building to another.

★ ★ ★

The ultimate use should be considered. Sometimes wire will be taken off spools by automatic coil winding or motor winding machines. Under these conditions, the best type of winding will be required. Often the wire user with the automatic machine will require that the wire be lubricated before winding. This, of course, enables the wire manufacturer to wind his wire with the least possible tension.

★ ★ ★

Other cases arise where the wire user may specify that the wire must be wound dry because he cannot tolerate oil on the wire for his ultimate use. Such a condition should be taken into account when specifying tension and winding specifications.

★ ★ ★

These are some of the variety of conditions of ultimate destination and use which the wire manufacturer must consider in specifying his winding tension. He is the one who should make the decision as to what tension must be used.

Determining Spooling Tension by Test

The best way to evaluate proper spooling tension is to run tests with conditions approximately as closely as possible the actual conditions under which the wire will be wound. Very often the wire manufacturer will have equipment available on which he can run wire to try out different spooling tensions. Where such equipment is not available, a test set-up should be rigged so that the tensions may be determined as desired.

★ ★ ★

Fig. 10 shows the type of test set-up which will give sufficient information on which to base a decision as to the amount and variation of acceptable spooling tension for a given application.

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The elements of this test set-up are quite simple. First, there is an unwinding stand for the supply spool. This stand should be equipped with some sort of brake such as might be found on the process equipment.

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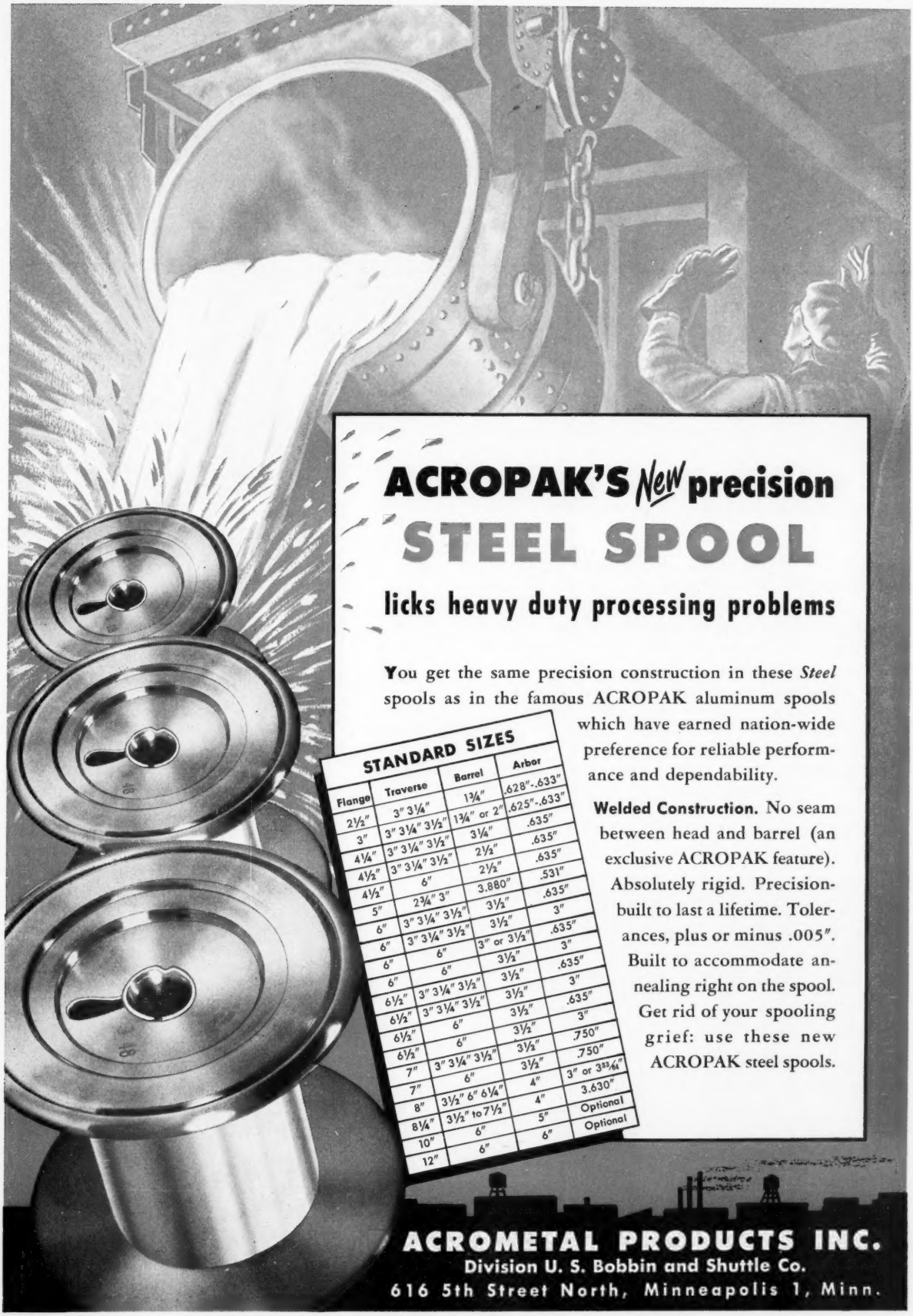
The wire is pulled off the unwinding stand by means of a capstan. The main features of this capstan are that it should have a means for adjusting the speed over the range of speeds which the wire

(*Please turn to page* 316)



ACROPAK'S *New* precision STEEL SPOOL

licks heavy duty processing problems

You get the same precision construction in these *Steel* spools as in the famous ACROPAK aluminum spools which have earned nation-wide preference for reliable performance and dependability.

Welded Construction. No seam between head and barrel (an exclusive ACROPAK feature). Absolutely rigid. Precision-built to last a lifetime. Tolerances, plus or minus .005". Built to accommodate annealing right on the spool. Get rid of your spooling grief: use these new ACROPAK steel spools.

STANDARD SIZES

Flange	Traverse	Barrel	Arbor
2½"	3" 3¼"	1¾"	.628"-.633"
3"	3" 3¼" 3½"	1¾" or 2"	.625"-.633"
4¼"	3" 3¼" 3½"	3¼"	.635"
4½"	3" 3¼" 3½"	2½"	.635"
4½"	6"	2½"	.635"
5"	2¾" 3"	3.880"	.531"
6"	3" 3¼" 3½"	3½"	.635"
6"	3" 3¼" 3½"	3½"	3"
6"	6"	3" or 3½"	.635"
6"	6"	3½"	3"
6½"	3" 3¼" 3½"	3½"	.635"
6½"	3" 3¼" 3½"	3½"	3"
6½"	6"	3½"	3"
6½"	6"	3½"	.750"
7"	3" 3¼" 3½"	3½"	.750"
7"	6"	3½"	3" or 3 33/64"
8"	3½" 6" 6¼"	4"	3.630"
8¼"	3½" to 7½"	4"	Optional
10"	6"	5"	Optional
12"	6"	6"	

ACROMETAL PRODUCTS INC.
Division U. S. Bobbin and Shuttle Co.
616 5th Street North, Minneapolis 1, Minn.

Valley Wire Mill Modernizes Annealing Practice

by Edmund D. Sickels, Editor
Wire and Wire Products
Stamford, Connecticut

When a mill installs new equipment and finds its investment justified by results from its operation, that experience is worthy of the attention of others performing similar operations. This description of Seymour's new annealing furnace is presented from that standpoint.

In an effort to reduce metal losses resulting from non-atmosphere annealing and to modernize this operation, in keeping with other plant improvements made in recent years. The Seymour Manufacturing Company of Seymour, Connecticut, one of the many wire mills that line the Naugatuck Valley, recently installed a continuous Westinghouse roller hearth annealing furnace.

★ ★ ★

This furnace, used for the heat treatment of various copper base alloys—nickel silvers and bronzes—was specially designed for Seymour's needs. It occupies a lineal space of 110′8″. Wire in coils is lifted from trucks to the 10 foot long entry table and deposited on rolls that move the work continuously through the furnace, where it emerges onto the discharge table later. This table is similarly 10′ in length. The coils are removed at intervals as required, ready for further processing.

★ ★ ★

Roll widths are 5′6″, which enable the furnace, operating a capacity, to anneal 4000 to 5000 pounds of wire per hour. Steel rolls are satisfactory for the entry and discharge tables and the cooling chamber but the rolls in the heating chamber must be of heat resisting alloy to withstand the temperatures involved. Each roll has a sprocket driven by a roller chain. A Reeves variable speed transmission controls the roll speed offering a ready means of adjustment of the speed of wire travel to the length of time that any particular alloy may require.

★ ★ ★

Wire enters the furnace directly into a pre-heat chamber or vestibule another 10′ long, from whence it passes into a radiant tube heating chamber, 20′4″ long, designed to operate at temperatures ranging from 1150°F up to a maximum of 1500°F. This heating chamber is only 19½″ high and is equipped with fans to uniformly distribute heat and eliminate hot spots. Temperatures may be varied readily and are automatically controlled and recorded at predetermined levels through instruments on a panel located at one side of the furnace. The automatic, precise control of temperature gives the wire a uniform, closely controlled grain size which, in turn, imparts uniform physical properties and working characteristics to the finished metal.

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Following the passage through the heating chamber, the wire travels into a 36½′ cooling chamber, through a 10′ discharge vestibule, where, as previously men-

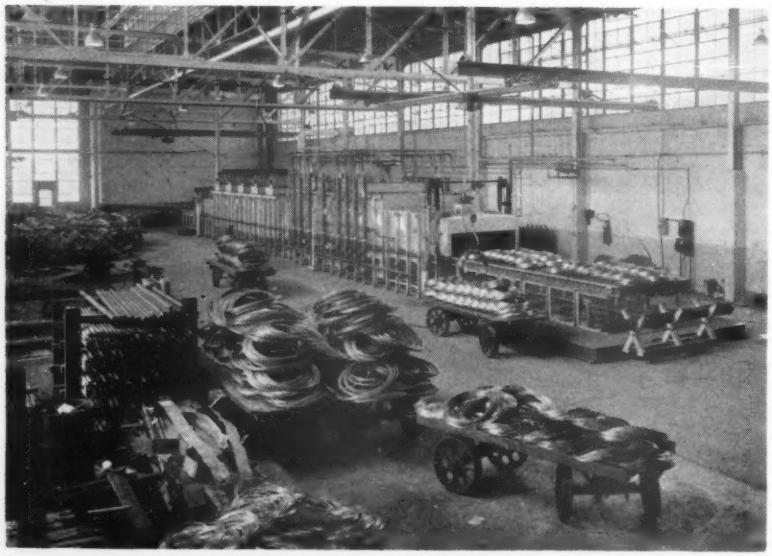

Figure 1. View of Seymour's Roller Hearth Annealing Furnace from Entrance End.

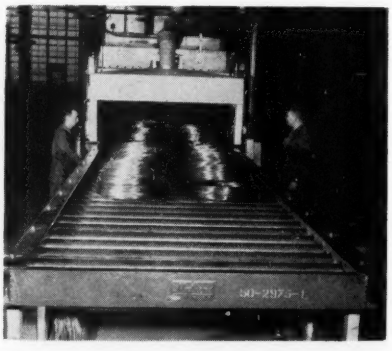

Figure 2. Coils of Wire Emerging from Discharge End of Furnace.

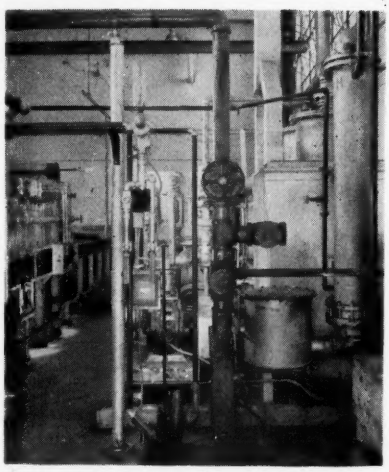

Figure 3. The Atmosphere Generator.

tioned, it comes out onto the discharge table to be picked up. At this point the wire is cool enough to be handled, as the temperature has dropped from 1200°F to 200°F or less.

★ ★ ★

Throughout the passage of the wire through the series of chambers in which the heat is at oxidizing temperatures, an atmosphere is maintained about the work to avoid this reaction, which occurs to a distressing degree in the older types of furnaces. The elimination of scaling, not alone saves metal, but pickling operations and the material handling attendant upon them.

★ ★ ★

The atmosphere used is produced beside the furnace in a generator that can be adjusted to various mixtures. The generator breaks down propane and air, the reaction facilitated by a catalyst and the application of external heat, into a gas having the following approximate composition:

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CO_2	4%
CO	17%
H_2	23%
N_2	56%

★ ★ ★

In the use of the atmosphere, the chambers are maintained in an oxygen-free condition to prevent the formation of scale. Hoods are used at the entrance and exit of the furnace to prevent any concentration of atmosphere gas around the furnace. These hoods lead into the outside air through the roof. A battery of nitrogen bottles are connected to the heating chamber to neutralize the mixture to below the explosive point whenever a power failure occurs.

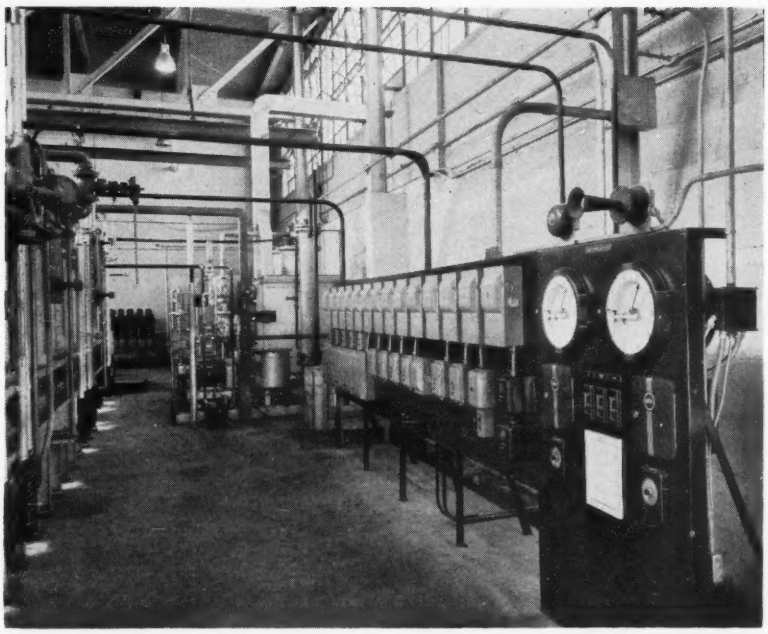

Figure 4. Control Panel on Right, Atmosphere Generator in Center and Furnace on Left.

One large control panel holds all of the instruments, maintaining recorded readings for all sections of the furnace and providing automatic control of temperatures. Instruments also govern and control the atmosphere producer.

★ ★ ★

The functioning of this furnace has proven so satisfactory and economical, as compared with the previously used older types, that the company is installing a second one that will be substantially similar, except for the lengths of the entering and discharge tables, which will be increased to permit of larger loads and longer intervals between loading and unloading.

★ ★ ★

CALENDAR OF COMING EVENTS

***April 16 and 17*—TRENTON REGIONAL MEETING at the Stacy-Trent Hotel, Trenton, N. J.**
***May 7 and 8*—MONTREAL REGIONAL MEETING at the Mount Royal Hotel, Montreal, Can.**
***June (date to be announced)*—PACIFIC COAST REGIONAL MEETING, San Francisco, Cal.**
***Sept. (date to be announced)*—NON-FERROUS DIVISION MEETING, Waterbury, Conn.**
***Nov. 9 - 12*—THE ANNUAL CONVENTION OF THE WIRE ASSOCIATION, with headquarters at the LaSalle Hotel, Chicago, Ill.**

All of these meetings will be publicized in Wire and Wire Products and complete programs published well in advance of the meetings. Members of The Wire Association will also be circularized by mail and hotel reservation cards, where needed, will be enclosed.

THE WIRE ASSOCIATION
RICHARD E. BROWN, Executive Secretary
453 MAIN STREET STAMFORD, CONN.

Solubility of Carbon

by Samuel J. Rosenberg
and
C. R. Irish

National Bureau of Standards
Washington, D. C.

Austenitic stainless steels, which are characterized by a distinctive crystal structure, are widely used because they combine superior resistance to corrosion with ease of working. Properties and applications of these steels are considerably affected by the amount and form of carbon they contain. Many experimental studies have been made of various properties of these steels; but surprisingly little attention appears to have been given to the determination of the limit of solubility of carbon in one of the most widely used forms of stainless steel, chromium-nickel austenite.

★ ★ ★

Because of the importance of such knowledge, the National Bureau of Standards recently made a study of the solubility of carbon in austenitic stainless steel containing 18 percent of chromium and 10 percent of nickel. These levels of chromium and nickel were chosen as representative of the widely used AISI types 302 and 304 stainless steels, frequently termed "18-8" steels. Sponsored by the Navy Bureau of Aeronautics, the investigation was conducted by the authors of the NBS metallurgy laboratories.

The full report, of which this is a digest, is entitled "Solubility of Carbon in 18 Percent—Chromium, 10 Percent Nickel Austenite," which is on file at the Technical Reports Section of the National Bureau of Standards, Washington 25, D. C.

★ ★ ★

The Bureau investigators found that with a carbon content of 0.007 percent, the lowest content studied, solution was substantially complete between 1300° and 1400°F. Solubility appeared to increase approximately linearly from about 1400° to 1975°F, the maximum temperature studied, where carbon solubility was approximately 0.08 percent. These values of solubility are appreciably lower than those previously reported. The solubility curve developed at NBS indicates that type 304 EIC (extra low carbon) stainless steel can be effectively annealed at 1700°F, but that ordinary type 304 stainless should be annealed at temperatures in excess of 1900°F if the carbon is to be fully dissolved. The NBS study also points up limitations on the effectiveness of attempts to eliminate intergranular embrittlement of austenitic 18% Cr-10% Ni steel by reducing carbon content.

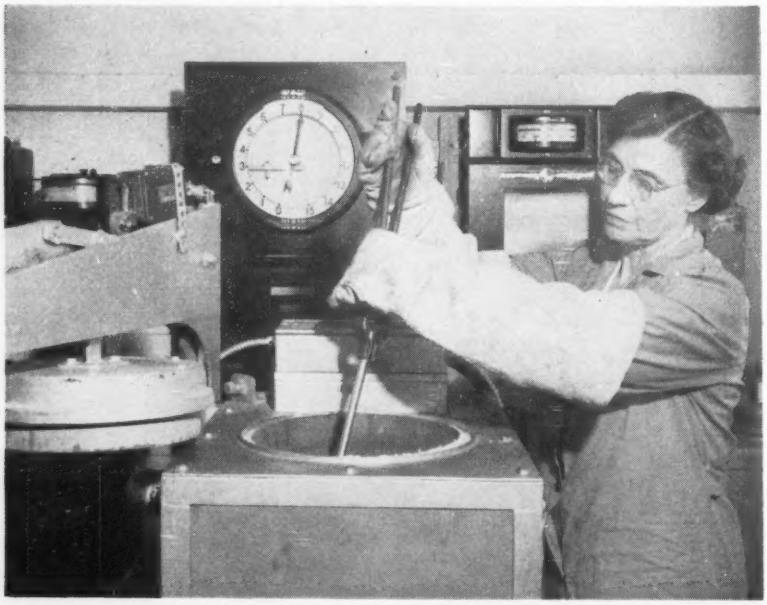

Figure 1. National Bureau of Standards metallurgist placing specimen rod in electric furnace during NBS investigation of the solubility of carbon in austenitic stainless steel. High-purity iron-nickel-chromium alloys with various additions of carbon were specially prepared at the Bureau. Specimen rods of these alloys were held in the furnace at 800°F for 6 weeks to precipitate carbon in excess of solubility at that temperature. Finally, samples of each rod were held at various higher temperatures to re-dissolve the precipitated carbides up to the limit of solid solubility. Values of solubility obtained at NBS were appreciably lower than those previously reported.

★ ★ ★

The annealing of austenitic stainless steels is often governed by the desire to obtain a completely austenitic structure—that is, a structure in which all carbon is in solution in gamma iron. To attain this end, annealing temperatures used in commercial practice are quite high, usually about 1950° to 2000°F. From another standpoint, however, such high annealing temperatures are undesirable; annealing at lower temperatures results in smaller grain size, which is thought to reduce susceptibility to intergranular embrittlement. Since the temperature at which all carbon is in solution increases with carbon content, it seems to follow that low-carbon steels may be an-

(*Please turn to page* 301)

Research and Engineering Progress in 1952

Abstracts of Interest to the Wire Industry
Taken from the General Electric Review, January, 1953

Ball-bearing Torque Tester

A new ball-bearing tester detects the presence of dirt, irregularities, eccentricity, and other faults that may occur in bearings having a three-eighths to five-eighths inch outside diameter. The bearings are tested in thrust only, according to newly established standards for ball-bearing testing. For production use, the tester will indicate torques exceeding a preselected maximum value above which a bearing must be rejected. And for laboratory use, a photoelectric recorder can be plugged directly into the electronic circuit to provide a continuous record of torque transmitted to the bearing's inner race.

Cable

Operating records over a period of years have shown that with increasingly heavy loads, lead sheath fatigue due to cable movement and internal pressures has been a major cause of trouble in the extensive underground duct systems used by electric utilities. A lead-alloy sheath of maximum long-time bend, creep strength, and maximum stability has been badly needed.

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During the past few years General Electric carried out a broad program of basic research on lead-alloy sheaths, resulting in the present tellurium-alloys lead sheath that has all the desirable characteristics. Important, too, is its adaption to standard lead presses because it is less affected by extrusion temperature and heat-treatment than other such alloys so far used for cable sheathing.

★ ★ ★

Because of the copper shortage, the technique of substituting aluminum conductors in varnished-cambric-insulated cable was perfected during the year. For equivalent load-carrying capacity, it means a larger conductor and a larger cable diameter but it does reduce weight in many cases. If copper continues scarce, the use of aluminum conductors as a substitute will increase.

★ ★ ★

Interlocked armor cable with non-magnetic armor is required for heavy-load single-conductor cables, and the recent substitution of aluminum for bronze armor has reduced weight and cost. Also, aluminum conductors can be substituted for copper, giving a further weight reduction. Another improvement has been the introduction of light-weight aluminum ladder racks on which the cable can be readily and compactly mounted in any position.

★ ★ ★

Power cables for low and medium voltages were introduced that use ultra-high-temperature insulations in the form of silicone resin and silicone rubber applied to a glass fabric. Spirally wound tapes of these materials insulate the conductors, with a silicone-base compound acting as a lubricant between the tapes. A high temperature sheath is applied for over-all protection. The cables show remarkable resistance to very high conductor temperatures, especially those resulting from overloads of several hours' duration.

Control Cable

Cables for supervisory control circuits, as well as telephone, police, and fire alarm, were developed with polyethylene insulation and thermoplastic jackets. They are resistant to moisture, flame, oil, acids, alkalies, and electrolys's. They can be produced with conductor sizes 24 Awg and larger, and with insulation thicknesses as low as 0.015 inch. Complete color coding is done by the use of colored polyethylene and spiral stripes.

★ ★ ★

The ignition cable line was augmented by the development of a Grade C ignition cable meeting the requirements of Army Ordnance specifications covering insulated high-tension ignition cable for ignition systems of internal combustion engines for aircraft, automotive vehicles, and marine service.

★ ★ ★

This, like Grade B all-silicone ignition cable developed in 1951, possesses excellent electrical properties even after prolonged immersions in petroleum hydrocarbons.

★ ★ ★

Capable of operation through —65 to +250 F, the cable has a stainless-steel conductor with a synthetic rubber insulation, a reinforcing glass-fiber braid, and an over-all sheath of neoprene rubber.

BX Cable

Smaller diameter, lighter weight, and greater resistance to impact and crushing have been made possible through the redesign of BX armored cable. The new design features a rot- and flame-resistant glass braid over the individual insulated conductors in place of the old conventional cotton braid. By taking advantage of the glass braid characteristics, it was possible to reduce the overall diameter and produce a cable much easier to handle and install.

Silicones

A new silicone-rubber compound for insulating cable and wire can be extruded and cured on standard cable-processing equipment at the high speeds normally used in cable making. Characterized by ease of processing, storage ability, and ex-

(*Please turn to page* 318)

PROGRAM

OF THE TRENTON REGIONAL MEETING OF THE WIRE ASSOCIATION

APRIL 16 and 17, 1953, STACY-TRENT, TRENTON, N. J.

THURSDAY, APRIL 16th:

8:00 A.M.—Registration Desk open from 8:00 A.M. to 6:00 P.M.

12:00 Noon—Board of Directors' Luncheon

1:30 P.M.—Technical Session:

CHAIRMAN

H. J. Jacobson, Director of Packaging and Loading, American Steel & Wire Div., U. S. Steel Corporation, Cleveland, Ohio.

PAPERS

"Packaging of Wire and Wire Products" by A. H. Andrews, Special Engineer, Bethleham Steel Company, Bethlehem, Pa.

"Mechanical Handling at the Wire Mills of John A. Roebling's Sons Corporation" by John Maisch, Wire Mill Foreman, John A. Roebling's Sons Corp., Roebling, N. J.

6:00 to 7:00 P.M.—Cocktail Party

7:00 P.M.—Banquet at the Stacy-Trent Hotel. The after dinner speaker will be Prof. John Tukevich, Assistant Professor of Chemistry at Princeton University.

FRIDAY, APRIL 17th: **PLANT TOURS**

9:00 A.M.—Busses will leave the hotel for the following inspection tours:

TOUR A: — Ferrous Division—to the Roebling Works of John A. Roebling's Sons Corp., Roebling, N. J.

TOUR B: — Non-Ferrous Division—to the mill of Crescent Insulated Wire and Cable Company, Trenton, N. J. Note: If enough people are interested in visiting the Roebling copper wire mill in the afternoon, a trip there will be arranged to follow the visit to Crescent.

PLANS FOR THE LADIES

An auxiliary tour for the ladies present is being arranged so that those coming with members and guests may be entertained while the men are attending other functions. Some points of interest will be the British Barracks, the Battle Monument, the Trent House, Pennsbury Manor (William Penn's home) and Washington Crossing Park. Luncheon will be at Bucks County's Bohemian Village in New Hope, Pa.

FEES: A single charge of $8.50 will cover registration, banquet, luncheon, cocktails and busses for the men.

A single charge of $6.50 will cover the tour, luncheon and the banquet for the ladies.

THE PROGRAM COMMITTEE

C. J. Murray, Jr., Vice Pres., Crescent Wire and Cable Company

R. H. Saviers, Works Met., American Steel & Wire Div., of United States Steel Company

L. D. Seymour, Pres., Marshall Richards Machine Co.

R. S. Worth, Manufacturing Mgr., John A. Roebling's Sons Corp.

G. A. Stone, Office Manager, Marshall Richards Machine Co., Inc.

Reservation cards will be mailed to members of The Wire Association.
If not a member and you want to attend, write for one to

THE WIRE ASSOCIATION

RICHARD E. BROWN, *Executive Secretary*

453 MAIN STREET **STAMFORD, CONN.**

PLAN NOW TO ATTEND THIS IMPORTANT MEETING!

Unique Non-Rotating Single Block Coiler and Non-Rotating Multiple-Block Takeup for Continuous Wire Processes

by N. M. Hudak, Chief Engineer
The Trauwood Engineering Company
Cleveland, Ohio

Excellent advantages afforded by the principle of the non-rotating or stationary single block coiler and the stationary multiple block takeup frame over that of the conventional rotating types are as follows:

(1) While the wire continues to be coiled, even at high speeds, coils of the same block may be removed safely and conveniently.
(2) Coil weights may be obtained greatly exceeding those ever before practically possible.
(3) Great increases in coiler or takeup frame speeds are obtained without added burden or danger to attendants.

When a mill installs new equipment and finds its investment justified by results from its operation, that experience is worthy of the attention of others performing similar operations. This description of Seymour's new annealing furnace is presented from that standpoint.

and special adaptions for specific needs are easily arranged. (See page 270.)

★ ★ ★

tioned to accepting the wasteful down time required for the stripping of finished coils, the down time is no longer compulsory. Also, since the stationary block coiler maximum speed is above drawing speeds, the wire drawing process may be made continuous regardless of wire speed or coil weight desired. The coiling operation need no longer be a limiting factor in wire drawing production efficiency.

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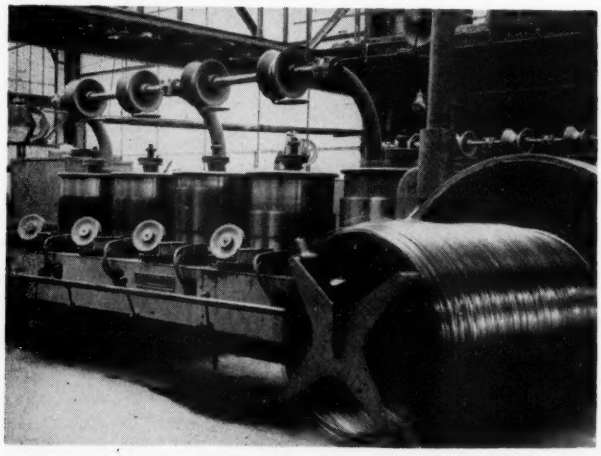


Figure I

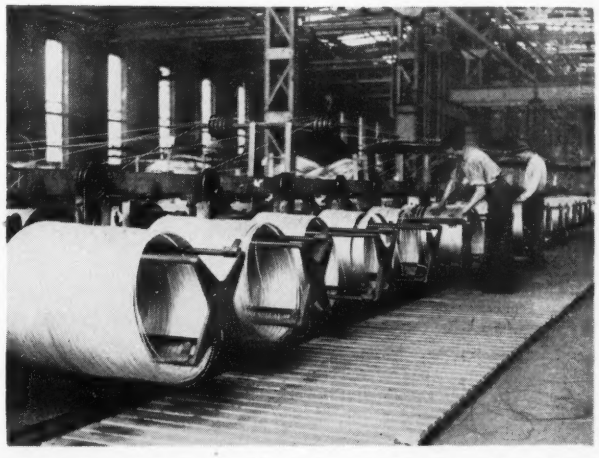


Figure II

The Stationary Single Block Coiler in Wire Drawing Processes

Fig. 1, a low carbon wire drawing process, shows the wire being drawn at very high speeds and being coiled upon the stationary block coiler. Though it may not be apparent in the photo, the block is not rotating.

★ ★ ★

Fig. 3 shows various methods of coil removal in actual practice. The stationary principle allows any method of coil removal desired

Since the stationary block coiler may be operated continuously so then also may the wire drawing operation now be continuous. Though many have become condi-

EDITOR'S NOTE

The universal coiler described in this article offers some unique features that will be of interest to many of our readers as a means of solving some of the present day high-speed, large bundle requirements of the wire mill.

In addition, the stationary block coiler inherently provides increased safety in operation even at very high speeds and very large coil weights. Also, the useful life of the wire drawing machine is increased through elimination of incessant starting and stopping for stripping of finished coils.

★ ★ ★

In operation the wire passes through the stationary block coiler as follows: The end of the drawn finished wire coming from the fin-

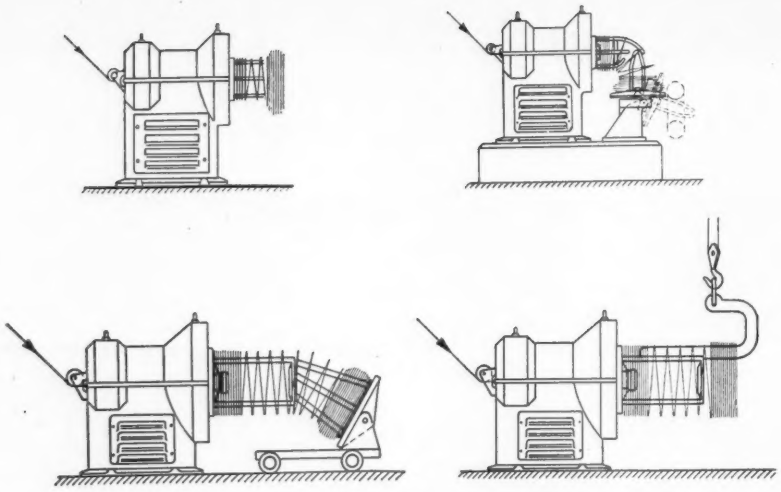


Figure III

ishing block is passed over a ball bearing guide pulley, into and through the hollow shaft, through a pilot tube, through a rectifying attachment, over another guide pulley, and then fixed on one of the bars of the stationary block. The rotating coiling disk passes the wire to the stationary block. When the motor drive is started, the rectifier attachment acting as a brake ensures perfect riding of wire onto and out upon the block. The wire surface is not marred. The guide pulleys are of large diameter to avoid small bends in the wire.

★ ★ ★

For non-ferrous wire the wire guide pulleys are of a non-metallic special fibre composition; the wire guide tube is of plastic; and the block upon which the wire is wound has 6 bars instead of 4 as on the block for ferrous wire.

★ ★ ★

The R.P.M. of the stationary block coiler is variable and thereby adjustable to the speed of the drawing machine.

★ ★ ★

The stationary block coiler may be positioned separately of the drawing machine, arranged according to available space and requirements.

The Stationary Multiple Block Takeup Frame in Low Carbon Annealing, Galvanizing, or other Coating Processes:

Fig. 2, a portion of a 40 wire galvanizing takeup frame, shows an operator preparing a coil for removal by hand as the wire continues to be coiled upon the same block. Here again, though it may not be apparent in the photo, all blocks including the one upon which the coil is being prepared for removal are not turning though the wire continues to be coiled. (See page 269.)

★ ★ ★

The stationary block takeup frame though serving in different processes from that of the stationary single block coiler allows all of the stationary single block coiler versatility and advantages that are not attainable with the rotating block takeup frame.

★ ★ ★

The stationary principle of operation is the same as that of the stationary single block coiler.

★ ★ ★

Though the methods of coil removal in Fig. 3 are shown with the single block coiler, they are also adaptable to the multiple block takeup frame. The stationary block principle allows on the takeup frame also any method of coil removal desired.

The stationary block takeup frame, except for the stationary principle operates in the same manner as the rotating type. Each block axle is driven by worm gears on the main shaft and the main shaft is powered through the conventional speed reducer and variable speed drive. The main shaft and worm wheels are enclosed in a cast iron housing filled with oil. Each block is provided with jaw clutch coupling to allow independent starting or stopping. The galvanizing frame photo (Fig. 2) does not show the completely closed frame construction that is now standard construction.

★ ★ ★

The stationary block takeup frame can be constructed with any desired number of blocks, and may be divided into several separate units in which case these may be fitted with two or more drives, as is often desirable in galvanizing wires of different diameters and speeds simultaneously. The takeup drives may be infinitely variable or constant. The blocks are conveniently removable and different diameter blocks may be used on the same takeup frame.

Summary:

In low carbon or non-ferrous wire drawing operations, the use of the stationary single block coiler eliminates the need of down time for stripping of finished coils.

★ ★ ★

In low carbon annealing, galvanizing, or other coating processes, coil weights need no longer be limited to man lifted sizes.

★ ★ ★

With the stationary single block coiler or the stationary multiple block takeup frame, coils may be removed in whatever manner desired, safely, regardless of wire speed or coil size, and without interruption of the process.

★ ★ ★

The stationary single block coiler and multiple block takeup frame can also be constructed to coil non-ferrous processed wire.

Chart for Calculation of Braided Shields

by Christian A. Alm, Engineer
Whitney Blake Company
Hamden, Connecticut

The author developed the chart described here to save time in his own work with his company. Its use eliminates time consuming calculations in the determination of shielding constructions and is sufficiently accurate for most industrial uses. It makes possible a quick evaluation of the influence of variations in construction. The broken lines on the right are an example of the valves pertaining to a shielding with 5 ends of .005′ wire per bobbin braided with 24 carriers. The required coverage (80%) gives the location of the xx axis. The intersection of this axis with one of the crosspoint curves gives the location of the YY axis. For a pitch diameter of .250″, a braid angle of 45° is indicated and the required number of picks per inch is approximately 15.8.

The chart is used with a transparent overlay having a horizontal axis XX, and a vertical axis YY.

★ ★ ★

Place the overlay on the chart with XX parallel to the bottom of the chart and coinciding with the desired coverage at the selected wire size and number of ends in the left part of the chart.

★ ★ ★

Move the overlay horizontally to make the intersection of XX and YY coincide with one of the two crosspoint curves in the right.

★ ★ ★

The top one of these two curves correspond with the 20 picks scale, while the lower one corresponds with the 40 picks scale.

★ ★ ★

Read the chart as follows:

Trace pitch diameter to XX, then along diverging lines to top border of chart and down to the main curve AA.

Read angle of braid on this curve.

Go from main curve horizontally to right border of chart, then along converging lines to YY.

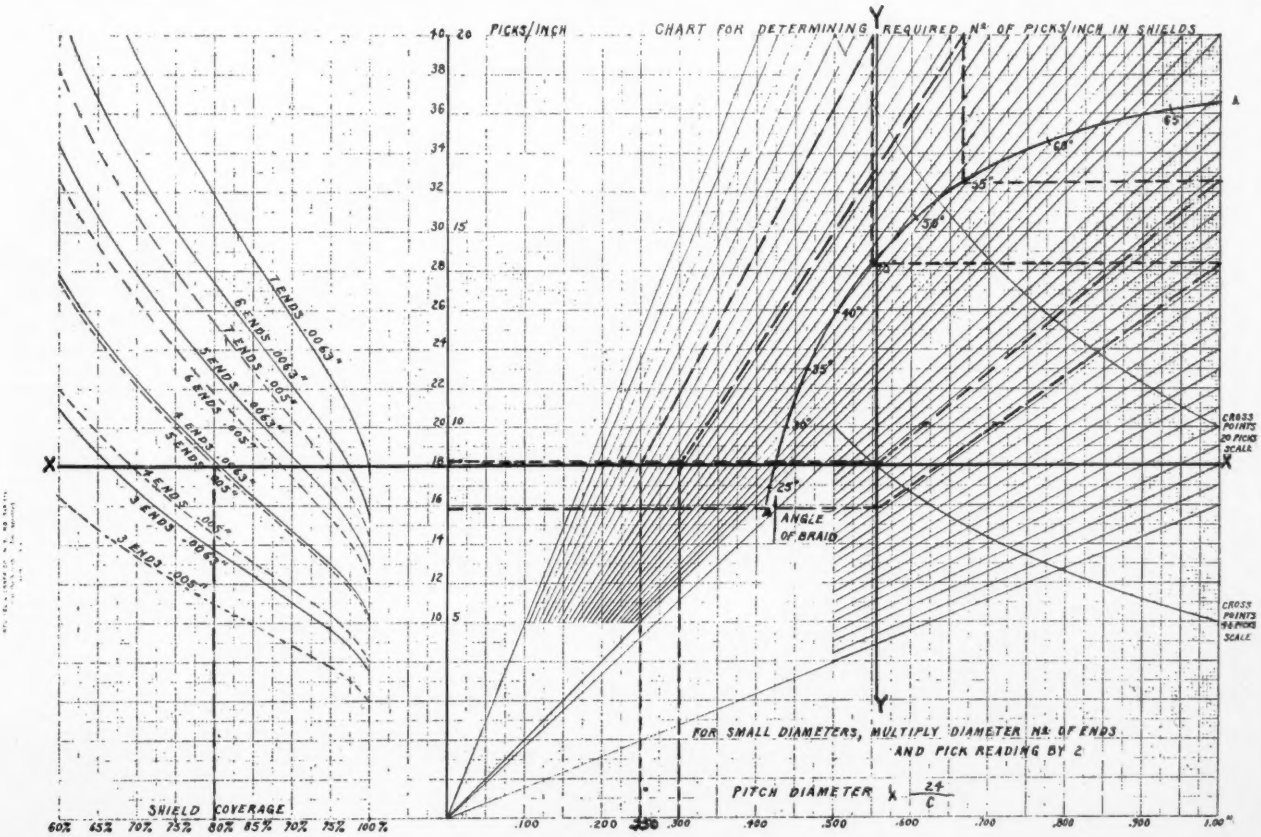
Read the required picks to inch on scale corresponding with the used crosspoints curve.

★ ★ ★

NOTE: The scale of pitch diameters is for a 24 carrier braider. When using a different number of carriers C, it will be necessary to multiply the actual diameter with 24.

$$\frac{}{C}$$

★ ★ ★



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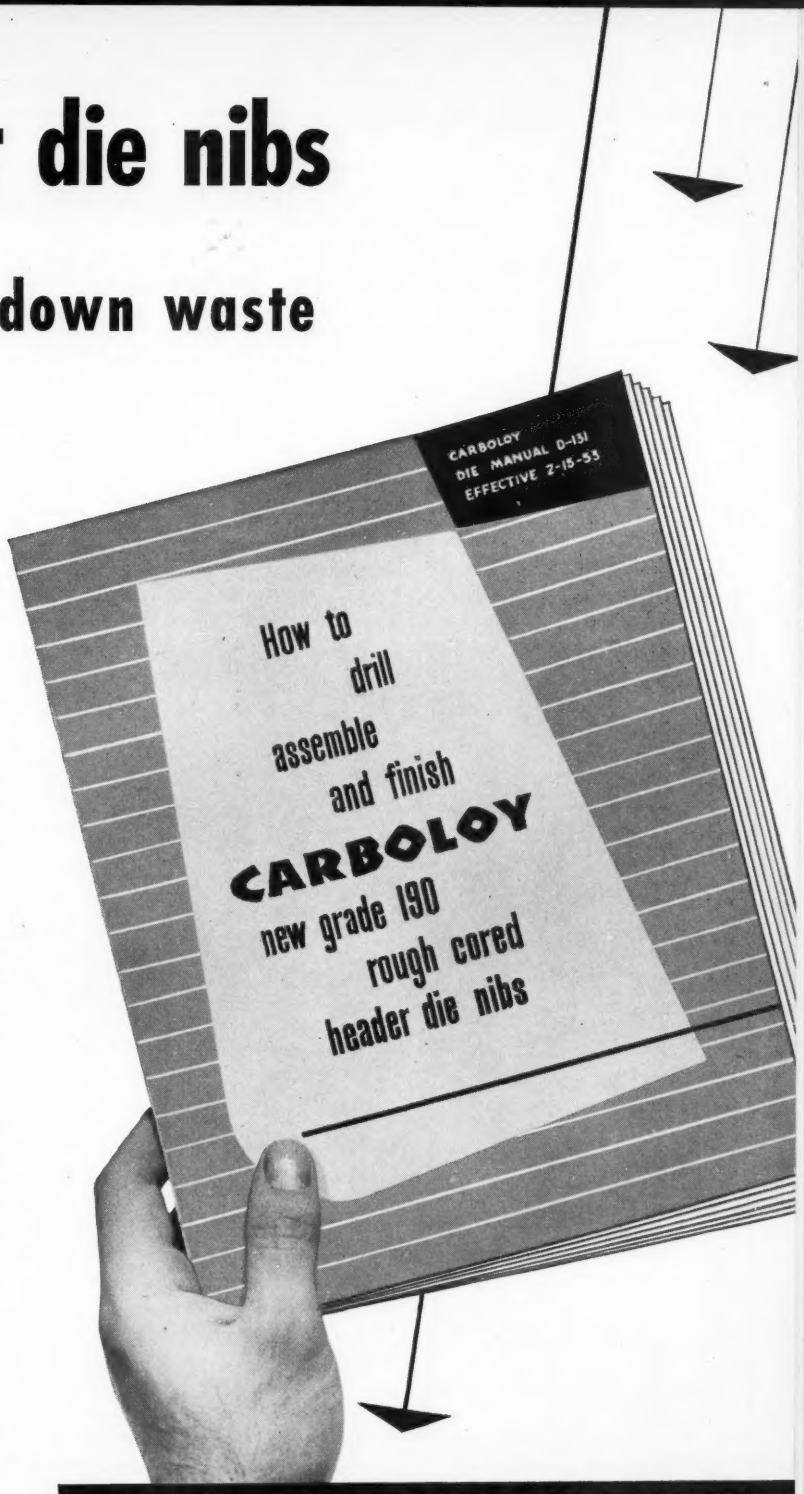

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Program

MONTREAL REGIONAL MEETING

OF THE WIRE ASSOCIATION, MOUNT ROYAL HOTEL, MONTREAL, CAN., MAY 7-8, 1953

THURSDAY, MAY 7th:

9:00 A.M.—Registration Desk opens. Wear your badge throughout the meeting.
10:00 A.M.—Busses leave for tour of Canadian Tube & Steel Co. plant.
12 Noon —Busses leave for Montreal East plants.
1:00-2:00 P.M.—Luncheon at Noranda Copper & Brass, Ltd. (Tentative arrangement.)
2:00-4:00 P.M.—Tours of Canada Wire & Cable and Noranda Copper & Brass plants.
4:00 P.M.—Busses leave Montreal East for the hotel, arriving at 5:00 P.M.
7:00 P.M.—Cocktail Hour, followed by banquet at 7:30 P.M., which will be addressed by a prominent member of the Canadian Parliament.

AIRPLANE VIEW OF THE BEAUTIFUL CITY OF MONTREAL

FRIDAY, MAY 8th:

9:00 A.M.—"Methods and Time Measurement": a discussion provided by Leethen and Simpson, Ltd., Management Consultants, Montreal.
10:45 A.M.—"History of Insulated Wires in Canada": a paper to be presented by D. S. Grant of Canada Wire and Cable Co., Ltd., Toronto, Can.
12:30-1:30 P.M.—Meeting and luncheon, Board of Directors of The Wire Association.
2:00 P.M.—Panel discussion "Inhibitors vs. Accelerators," participated in by representatives of prominent manufacturing concerns.
4:00 P.M.—"The Cold Pressure Welding of Wire": a paper and demonstrations by W. A. Barnes, Vice Pres., Eng., Utica Drop Forge & Tool Co., Utica, N. Y.

This paper will be followed by a showing of two motion pictures depicting operations at the Noranda and Steelco plants.

Fees: Registration and Bus Transportation: $5.00; Cocktail Party and Banquet: $6.00.

For the ladies who come to Montreal, a special tour of the city and a cocktail party has been worked out by the Program Committee. Information regarding these arrangements and costs may be secured at the time you register.

BE SURE TO MAKE YOUR PLANS NOW FOR THIS FINE MEETING

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

453 MAIN STREET **STAMFORD, CONN.**

Government Wire Production Information

"Small Business"

The Small Defense Plants Administration has taken a major step in its program to provide a new and more realistic answer to the question: "What is small business?"

★ ★ ★

SDPA Administrator John E. Horne announced that the SDPA has prepared new proposed standards for distinguishing small manufacturing concerns and has sent them to approximately 1,200 trade associations and small business groups concerned with manufacturing for their review.

★ ★ ★

Mr. Horne said that SDPA plans to adopt the new definition, perhaps with modifications, after the views of various industry and small business groups have been studied.

★ ★ ★

SDPA is given authority to define small business in the Defense Production Act which provides: " . . . a small-business concern shall be deemed to be one which is independently owned and operated and which is not dominant in its field of operation. The Administration (SDPA), in making a detailed definition, may use these criteria, among others; independency of ownership and operation, number of employees, dollar volume of business, and non-dominance in its field."

★ ★ ★

Mr. Horne said that most persons concerned with the problem have long agreed that "small business" is a relative term and that a single standard of size is not valid for all industries. What is large in one industry may be small in another. Our new proposed size standard for identifying small manufacturing concerns is based on employment and covers 452 manufacturing industries included in the Standard Industrial Classification, which has already been accepted by both industry and Government as a common basis for dealing with industrial data.

★ ★ ★

He said that the problem has been narrowed down somewhat by setting absolute lower and absolute upper limits of size. Accordingly, all manufacturing concerns employing no more than 100 persons will be considered small regardless of the industry in which they do business; similarly, concerns employing more than 2,500 workers cannot ordinarily be regarded as small, at least in the sense of requiring special consideration under Government programs.

Tensile Properties of Copper

The National Bureau of Stand-

MICROMETER PRECISION — MICRO-WELD — TRADE MARK REGISTERED

MODEL M-T, FOR BENCH MOUNTING

This welder was designed and developed expressly for welding all types of fine wire: Aluminum, Copper, Brass, Bronze, Steel and Steel Alloys, ranging in size from .005" to .020" diameter.

Unit design of frame, transformer and power sub-assemblies permit other range of sizes to suit requirements.

Equipped with a temperature indicating annealing and tempering device, voltage regulator and meter to compensate for voltage fluctuation, wire cutters, extra large 5" diameter magnifying glass, fluorescent light and extension cord. Welder can be supplied for bench mounting, or mounted on 4-wheel truck.

The adaptability of this unit for welding all types of wire, either ferrous or non-ferrous, in sizes from .005" to .020" diameter, makes it ideal for the fine wire manufacturer.

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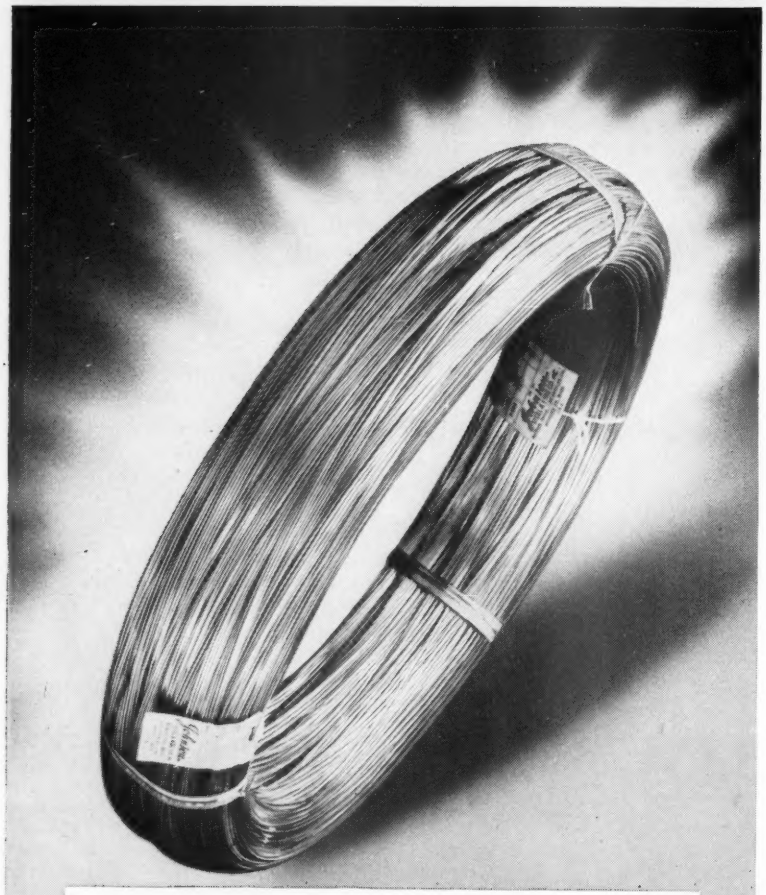

High Quality High Carbon Wires

If you are not afraid to face the music,
you may some day lead the band.

And, this reminds us that Music Wire, although originally named because of its use in producing musical tones, is used today far more extensively for other purposes. Johnson Music Wire is high grade, high carbon wire, and we can claim, even though you may think not modestly, that our music spring wire is the highest quality you can obtain, and ideal for thousands of uses.

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ards has recently completed a study of the effect of prior strain history on the room-temperature tensile properties and microstructure of high-purity copper. Tensile tests were made on oxygen-free high-conductivity (OFHC) copper initially as annealed, as cold-drawn different amounts, and as prestrained in creep at 110°, 250°, and 300°F. The Bureau's results show that the strength, ductility, and hardness of the copper are markedly affected by its prior strain history. The investigation was conducted by William D. Jenkins and Thomas G. Digges of the NBS thermal metallurgy laboratory.

★ ★ ★

Considerable interest has been stimulated among metallurgists by suggestions that the tensile properties of metals are dependent only upon the instantaneous strain state of the metal, and are practically independent of the manner in which this state is attained. Previous NBS work has shown, however, that as some metals and alloys are deformed, hardening and recovery occur in such a manner that subsequent tensile properties are materially affected.

★ ★ ★

Cold-drawing the copper at a relatively fast strain rate generally resulted in increased strength and hardness, but in decreased ductility (as measured by the extension and reduction of area at fracture). Prestraining at a high temperature or at a low strain rate, on the other hand, generally resulted in reduced strength and hardness as well as reduced ductility. Specimens with the larger grain sizes showed lower yield strengths and hardness values; but grain size had very little effect on tensile strength, fracture strength, and ductility. Hardness values of the fractured tensile specimens, obtained at room temperature, confirmed the results of the tensile tests.

★ ★ ★

The microstructures of the tensile specimens were, in general, consistent with previous assumptions that cracks of a transcrystalline nature, and substructures, are nucleated during the second stage

of creep, and that these phenomena are associated with prestraining at low temperatures and fast strain rates. Cracks thus nucleated grew to microscopic dimensions during the tensile tests. Prestraining at elevated temperatures and slow strain rates tended to result in fractures of a less ductile type and in cracks of an intercrystalline nature.

* * *

For the complete report, readers may order **J. Research NBS 49,** 167 (Sept. 1952); reprinted as NBS Research Paper 2354, 15 cents from Superintendent of Documents Government Printing Office, Washington 25, D. C.

Producers of Brass Mill and Copper Wire Mill Products

The Office of Price Stabilization has announced that producers of brass mill and copper wire mill products will not be required to recalculate ceiling price adjustments covering costs of foreign copper before April 30, 1953.

* * *

On July 1, 1952, these producers were permitted to increase their ceiling prices to reflect increased cost of foreign copper. This action was taken under Amendment 1 to Ceiling Price Regulation 63, covering brass mill products, and under Amendment 1 to Ceiling Price Regulation 110, covering copper wire mill products.

* * *

When these price adjustments were authorized it was contemplated that the adjustments would be effective for a limited period of time and that a recalculation of the adjustments would be made at a later date dependent upon changes in the copper market.

* * *

Since that time producers have continued to purchase foreign copper at the prevailing price of 36½ cents a pound, the same price used in determining the ceiling price adjustments authorized on July 1. Accordingly, no changes in the July 1 adjustments have been necessary and OPS had indicated that no recalculation of the adjustments

COVER WIRE
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KNITTERS

Model C-3H Knitter & Haul-Off Reel Stand

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★ Save on cost of yarn
★ Boost labor output 600%
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★ Conserve floor space
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Knitting Head Enlarged View

This *Fidelity Sinfra* Wire Covering Machine offers you high production speed and low operating cost. The output of *one* Knitter equals 15 conventional machines. Savings in yarn costs and direct labor alone pay for this new equipment in 12 to 24 months. Knit products are universally used and meet all standards.

The modern Fidelity Sinfra method uses fewer yarns and large 3 pound cones located on a stationary creel. High-speed, rotating Knitting Heads cover the wire at 30 or more feet per minute. Design permits horizontal operation at convenient working level with no crawling or stretching. Automatic electric stop motions and other advanced features cut maintenance and down time.

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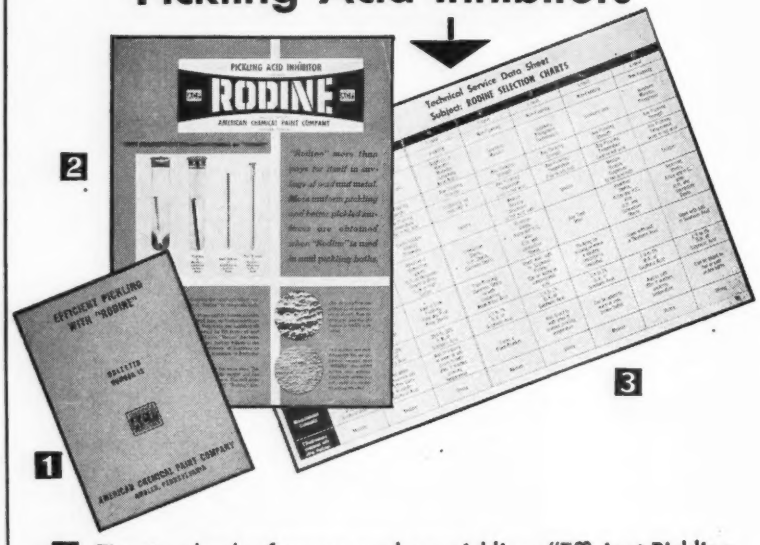

1 The standard reference work on pickling, "Efficient Pickling With RODINE" — Bulletin Number 13 — is now available in a new, revised edition.

2 This new 4-page general descriptive folder presents essential information on "Rodine" pickling acid inhibitors.

3 The recently revised "RODINE SELECTION CHART" gives characteristics of and uses for typical "Rodines" used with sulfuric and muriatic acids. Technical Service Data Sheet No. 13-1-1-4.

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would be required before April 1, 1953.

★ ★ ★

Because of the fact that copper must now be purchased in Chile, rather than in New York, there is a time lag between the time of purchase and the sale of the finished product running anywhere from 90 to 120 days. The industries affected have requested that any recalculation of the July 1 adjustment should not be required before April 30, 1953, so that they may buy at the 36½ cents price in anticipation of being able to sell the same material without the July 1, 1952, adjustment being reduced by OPS before that time.

Hamilton Watch Chemists Commended by Bureau Of Standards

The personnel and facilities of the **Hamilton Watch Company's Chemical Laboratory** were recently commended by the National Bureau of Standards on acceptance of the firm's analysis of a new chemical standard, Electrical Alloy 169. The commendation is a tribute to the skill of Hamilton's chemists and the precision of their equipment.

★ ★ ★

A function of the Bureau of Standards is to establish and distribute chemical standards of metal alloys used in industrial production. When a chemical standard is required for a new alloy, the bureau sends milled samples of the alloy to a selected group of industrial laboratories whose personnel and equipment are capable of rendering an accurate analysis. Hamilton's chemical laboratory is among this group.

★ ★ ★

Hamilton's analysis of Alloy 169 revealed a composition of 14 elements. The alloy contained nickel and chromium in large percentages. Additional elements present ranged from 1.42% silicon to as little as .0006% calcium.

★ ★ ★

These same facilities that made possible the accurate analysis of Alloy 169 are used to constantly check the composition of raw ma-

terials destined for use in the production of watches. Hamilton's chemists regularly provide laboratory analyses of elements involved in experimental projects of the firm's various research laboratories.

★ ★ ★

A noteworthy accomplishment of Hamilton's research was the development of a new non-corrosive anti-magnetic, mainspring alloy, "Dynavar." The research staff also developed the complete facilities to produce watch mainsprings from raw materials to finished product. G. E. Shubrooks, Hamilton's research laboratory manager, recently announced that the firm's metals processing section is now accepting work from other manufacturers for precision wire drawing and strip rolling. Hamilton's metals processing equipment is specially suited to small quantity production.

Meeting of the Wire Association's Committee on Stranding Specifications

A meeting was called on January 7, 1953 at The Biltmore Hotel, New York, with **J. R. Garey,** William Brand & Company, Inc. Willimantic, Conn., presiding as chairman. Members of the committee are **Howard Allen,** Nonotuck Mfg. Co., **Vincent McBride,** Plastic Wire and Cable Corp., **Peter J. Kelley,** Camden Wire Co. Inc., **J. G. Tomey,** Plastoid Corp., **T. V. Henry,** Flexo Wire Division, Copperweld Steel Co., and **S. F. Luques,** William Brand & Co., Inc. In the absence of Mr. McBride and Mr. Luques, Messrs. Gleeson and Miller of their respective companies attended. Benoit J. Sirois, Chairman of Sub-Committee 4 of the ASTM B1 Committee was present.

★ ★ ★

The purpose of this was to review the results outlined in the Electrical Testing Laboratories report #348830 of January 6, 1953 on electrical and physical tests of tinned copper wire. This report was the result of the Committee's recommendations in its meeting of November 25, 1952 as outlined in paragraph 2, page 3, of the November 25th minutes.

★ ★ ★

3 ways *Solar* solves a sales problem... IN YOUR FAVOR

...with SOLDURA GRAY WIRE COLOR SOLUTION

1 GREATER SALES APPEAL!

Gray Soldura gives the buyer visible evidence that the flame-proof compound on non-metallic sheathed cable and service entrance cable is completely sealed and covered. Moreover, it camouflages service entrance cable used on white houses and forms an excellent base for the subsequent application of house paint.

2 STAYS CLEANER!

Gray Soldura *looks* cleaner because it *is* cleaner. It's used with a clear wax top dressing (which makes it easier to pull through joists or fish through conduits) and will not mark up walls during installation. Workmen's hands stay cleaner, too.

3 PROTECTS against STICKING!

Actual laboratory tests have shown that gray Soldura, applied with a proper saturant and finish, will prevent sticking at temperatures as high as 140°F. and will not flake off under freezing conditions.

FOR GREATER SALES APPEAL... FOR CLEANER APPEARANCE, EASIER HANDLING, AND FREEDOM FROM STICKING OR FLAKING... USE SOLDURA... THE GRAY WIRE COLOR SOLUTION THAT BUILDS SALES.

SPECIFICATIONS*

Weight per gallon	15-16 lbs.
Total solids	75-80%
Viscosity, Gardner Mobilometer @ 77°F., 250 grams load	15-20 seconds
Estimated coverage—Sq. Ft. per gal.	1250-1500
Number of coats recommended	Two, for best results
Colors	Light, medium and dark gray

**Gray Soldura is soluble in alcohol, acetone, and common lacquer solvents, but is not soluble in gasoline and petroleum solvents.*

FOR SPECIFIC INFORMATION ABOUT GRAY SOLDURA MS-551 AND A COMPLETE REPORT ON OUR LABORATORY TEMPERATURE TESTS, WRITE TO SOLAR COMPOUNDS CORPORATION.

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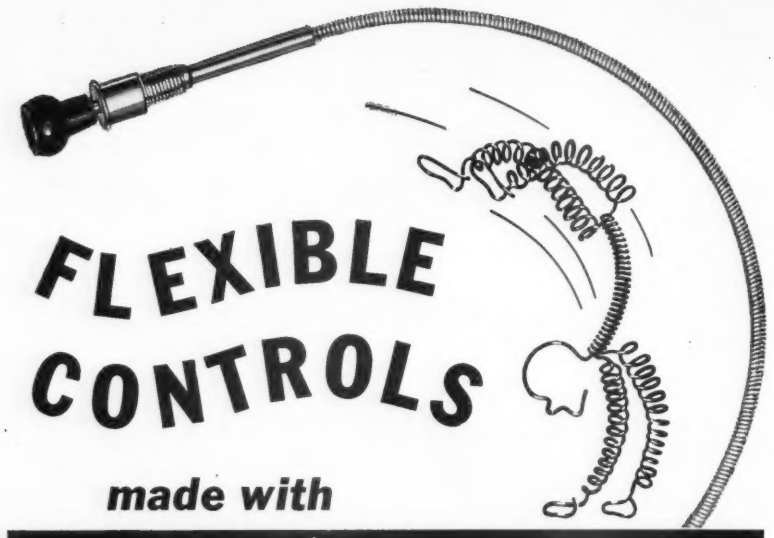

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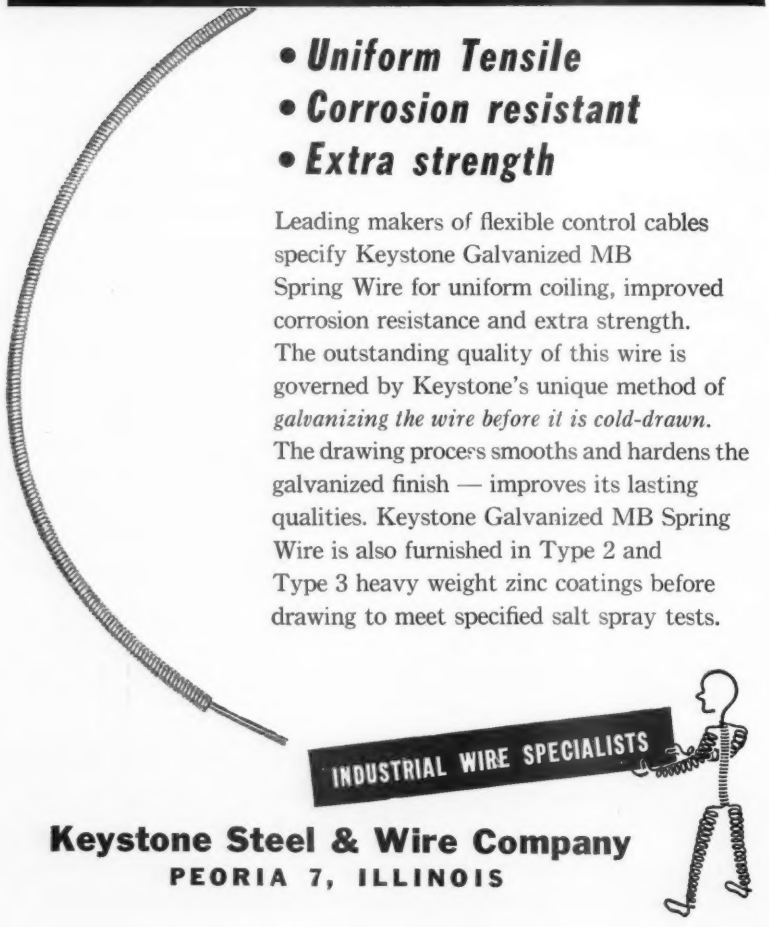
- Corrosion resistant
- Extra strength

Leading makers of flexible control cables specify Keystone Galvanized MB Spring Wire for uniform coiling, improved corrosion resistance and extra strength. The outstanding quality of this wire is governed by Keystone's unique method of *galvanizing the wire before it is cold-drawn.* The drawing process smooths and hardens the galvanized finish — improves its lasting qualities. Keystone Galvanized MB Spring Wire is also furnished in Type 2 and Type 3 heavy weight zinc coatings before drawing to meet specified salt spray tests.



INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

As a result of a general discussion and a brief but thorough examination of the test results it was agreed that problems definitely do exist particularly as to physical and electrical characteristic changes when single-end tinned wires are bunched into variable lay length conductors.

★ ★ ★

The evidence and discussion resolved in complete accord within the committee that this problem should be presented as a discussion at the sub-committee 4, ASTM B1 meeting scheduled for January 8th.

★ ★ ★

It was further decided by the committee that if the presentation to sub-committee 4 of ASTM B1 was successful and that this committee accepted the responsibility of carrying this work to a conclusion that the work of the Committee on Stranding Specifications, Non-Ferrous Section of the Wire Association would be concluded excepting in a standby capacity for consultation or assignment where needed and requested by sub-committee 4 of ASTM B1. The committee meeting of January 7th was adjourned with the understanding that all members present would attend sub-committee 4 of ASTM B1 on January 8th.

Meeting of Sub-Committee 4 ASTM B1 Committee on January 8, 1953

Benoit J. Sirois, Chairman of this committee, presided.

★ ★ ★

The subject that concerned your committee had previously been placed on the agenda of ASTM and it was opened for discussion by Mr. Sirois early the afternoon of the 8th. Copies of the Electrical Testing Laboratories report were available in quantity to supply each of the approximately 60 members present with one copy each. As a result of the discussion the assembled members of the ASTM recognized the problems and felt that a specification incorporating test results as applicable to individual constructions and lay lengths should be created. Such

a motion was passed at this meeting and Mr. Sirois, the chairman, immediately appointed a task force consisting of copper product producers, intermediate copper fabricators, insulators, equipment manufacturers (end users), trade association representatives (RTMA) and representatives of The Air Force, Assesa and Navy BU Ord. with Mr. Howard Allen of the Nonotuck Mfg. Company as chairman to take over and bring this entire matter to a conclusion with the objective of writing specifications as outlined in the above motion. Members of our committee as well as members of the Non-Ferrous Section of The Wire Association will be kept informed of the progress of the ASTM Committee upon request to Mr. Allen who is chairman of ASTM Task Force and a member of The Wire Association.

★ ★ ★

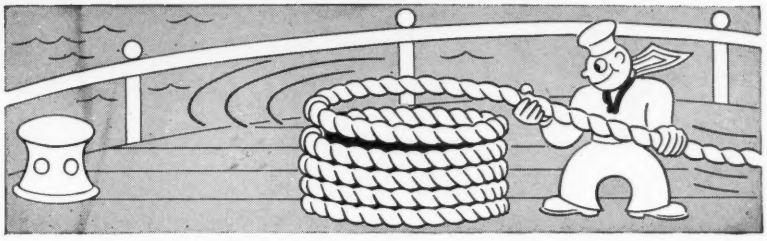
In view of ASTM B1 sub-committee 4's acceptance of this project and a task force created to bring same to a prompt and successful conclusion, it is the consensus of opinion of The Wire Association Committee that no further action on its part is necessary unless called upon by ASTM. In the light of this opinion the Committee on Stranding Specifications, Non-Ferrous Section of The Wire Association will remain status quo as to membership and objective but will remain completely in-operative with no future meetings planned or held unless re-activated by request of sub-committee 4 of ASTM B1 or the task group of ASTM assigned to this problem.

★ ★ ★

The only remaining activity of the Non-Ferrous Section, Wire Association Committee on Stranding Specifications is to balance the budget. Necessity for a budget was created by the testing requirements necessary to perform its assigned duties. This was agreed upon by the committee in its meeting of November 25th and further elaborated upon in your chairman's letter of December 1, 1952.

★ ★ ★

In your chairman's letter of December 1st, an estimated total cost for testing was established as



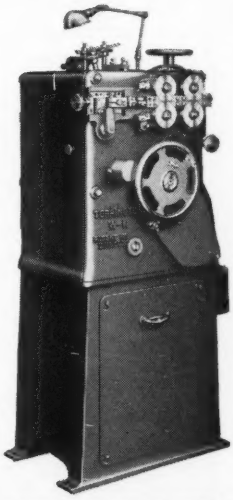
For a spring with accurate coiling

see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

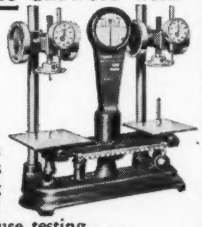
Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"



MODEL W-11 SPRING COILER

Wire diam. range: .015" to .072". Length per spring: 0" to 42". O. D. Coil Range: 3/32" to 1 9/16". Produces 23 to 190 springs per minute with variable speed drive. Extra wire feed gears, torsion, other attachments available.

NOW... Spring Makers and Users can get the same answers with The TORRINGTON SPRING TESTER



An accurate, uniform and inexpensive means of measuring spring load and deflection! For inspection or in-use testing . . . to aid in designing and developing springs for specific uses or as a basis for statistical quality control. Write today for illustrated bulletin on the Torrington Spring Tester!

The TORRINGTON MANUFACTURING COMPANY TORRINGTON, CONNECTICUT

AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: IMPROVED DRAWING AND COLD FORMING WITH GRANODRAW

INTRODUCTION:

When steel is phosphate coated with "Granodraw" prior to working it, drawing, extrusion, and other cold forming operations are greatly improved. In fact, the protective phosphate coating makes the cold extrusion of steel possible.

Getting cold steel to flow depends on the unique properties of this coating. Its non-metallic phosphate crystals are physically and chemically adapted to acquire a strongly adsorbed lubricant. The combination of adherent phosphate coating and adsorbed lubricating film possesses a low coefficient of friction while maintaining its integrity under extremely high deforming pressures.

The drawing of wire and many other cold forming operations — including the cold extrusion of steel — are greatly facilitated by the application of a "Granodraw" phosphate coating and a suitable lubricant prior to working.

"GRANODRAW" DATA

"Granodraw" zinc phosphate coating chemical is applied to pickled surfaces in an immersion or spray process. When used with a suitable lubricant, the coating reduces friction under conditions of low, medium, or high deforming forces encountered in such typical operations as: cold extrusion of steel; cold shaping; deep drawing (tubs, cartridge cases, shells, etc.); stamping; drawing of wire and tubing; ironing; necking; nosing; and upsetting.

ADVANTAGES OF PHOSPHATE COATING WITH "GRANODRAW" PRIOR TO COLD FORMING STEEL

The following are among the advantages indicated for phosphate coating with "Granodraw" prior to cold forming steel:

Drawing of wire, bars, tubing, etc. — Improved lubrication; improved surface; less scratching; reduced pull; greater percent reduction per pass; reduced die wear; longer die life; lower die maintenance and cost; reduction in corrosion.

Drawing of stampings, shells, shell cases, etc. — Improved lubrication; reduced breakage; reduction in scrap; deeper draws; less scratching; elimination of some annealing; less wear on dies.

Cold Extrusion — Improved lubrication; increased strength of parts; improved surface; reduction in load on press; greater dimensional accuracy; more uniform wall thickness; longer extrusions; elimination of some annealing; less corrosion.

CHEMICALS ACP PROCESSES WRITE FOR FURTHER INFORMATION ON "GRANODRAW" AND ON YOUR OWN METAL PROTECTION PROBLEMS. CHEMICALS ACP PROCESSES

$250.00 making for a pro-rated cost to the nine organizations supporting this program of a maximum of $30.00. However, prior to actual submission to Electrical Testing Laboratories for tests it was found desirable to expand the test procedure by the inclusion of tensile strength and elongation results on the bunched conductors as a whole. It was further found necessary to have 100 copies of the report reproduced so that adequate copies would be available for the ASTM B1 Committee meeting as well as the members of the Non-Ferrous Section interested in this project. The additional test procedure and copies of the report increased the cost from $250.00 to approximately $400.00 with the exact figure not known at this moment. This would increase the prorated cost from approximately $30.00 to approximately $45.00. When Electrical Testing Laboratories invoices are presented, prorated figures will be established and invoices to cover will be submitted to those companies supporting this activity.

★ ★ ★

This meeting was well-attended, with a large number of members of The Wire Association present, together with representatives of the RTMA, who participated in the discussions and helped to formulate the committee's ideas on the types of standards required.

New Stapling Machine For Cartons

International Staple & Machine Co., 801 East Herrin Street, Herrin, Illinois, announces the "Staple King," a new production model in its line of retractable anvil stapling machines. The equipment, operated by air, is designed for simultaneous closing of tops and bottoms of center slotted cartons and partial or full overlap cartons, either corrugated or fibre, at the rate of more than 350 an hour.

★ ★ ★

The patented retractable anvil feature of the stapler permits closure from the outside, after cartons are filled with merchandise, products or materials.

Outstanding Personalities of the Wire Industry

Stier Named Nopco Assistant Vice-President

The appointment of **George G. Stier** as an assistant vice-president of **Nopco Chemical Company,** Harrison, New Jersey, effective January 1, has been announced by Thomas A. Printon, president.

★ ★ ★

Mr. Stier has been associated with the Nopco organization since 1932. He will head up the company's LOCKFOAM Division, a department recently organized for the development of new uses and markets for a unique foamed-in-place plastic material currently sold almost exclusively to the aviation field. In addition, he will be responsible for the handling and negotiation of all military orders and contracts, and for the Industrial Market Development Department.

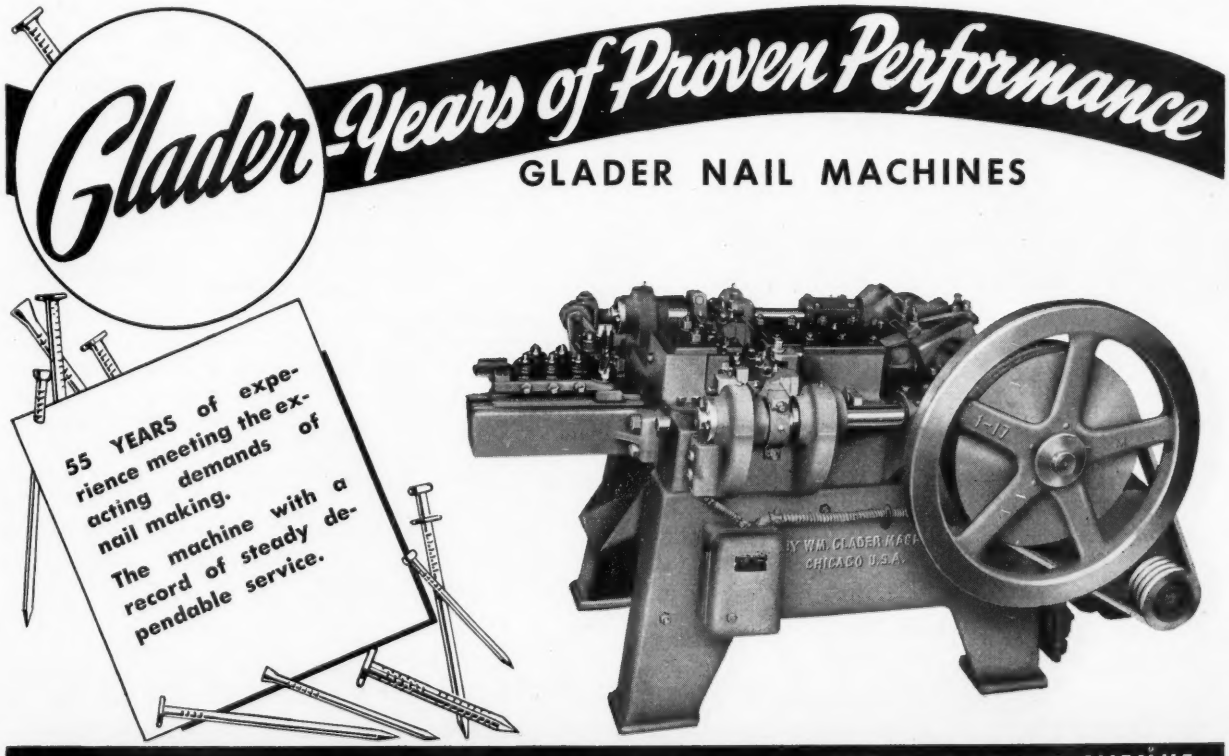
George G. Stier

★ ★ ★

Other promotions announced were: **Dr. C. I. Post,** vice-president in charge of all Vitamin Division sales and research; **Dr. Edwin A. Robinson,** vice-president responsible for Textile Chemicals and Technical Director of Industrial Laboratories; **Harry A. Batley,** assistant vice-president in charge of Industrial manufacturing, pilot plant and semi-works operations, and plant coordinating; **Walter B. Morehouse,** assistant vice-president, sales manager for the Paper Chemicals Department and supervisor of all Industrial Division field personnel.

Two New Gen'l Superintendents Approved by A. S. & W.

Official announcement of the appointment of **Umbert F. Corsini** as general superintendent of the Steel


Glader-Years of Proven Performance
GLADER NAIL MACHINES
55 YEARS of experience meeting the exacting demands of nail making.
The machine with a record of steady dependable service.
Wm. GLADER MACHINE WORKS
210 N. RACINE AVENUE
CHICAGO 7, ILLINOIS
Export Dept.: 122 E. 42nd Street, New York 17, N. Y.

& Wire Works of the **American Steel & Wire Division** in Donora, Pa., was made by **Lloyd F. McGlincy,** Pittsburgh district manager of this Division of United States Steel Corporation.

★ ★ ★

Mr. Corsini, who was general superintendent of American Steel & Wire's South Works in Worcester, Mass., succeeds Harold Cope who has been named Duluth (Minn.) district manager of operations.

★ ★ ★

He was born in Plymouth, Mass., on June 26, 1911, holds a B.S. Degree from Worcester Polytechnical Institute.

★ ★ ★

He began his steel career as a machinist in the Worcester plant in September, 1933. After several promotions, Mr. Corsini moved into the operations end of steel making by becoming a student apprentice in the open hearth and rolling mill in October, 1935. Three years later he was made assistant general foreman of the rolling mill, and became assistant superintendent of the open hearth department in February, 1941.

★ ★ ★

Two years later he was promoted to assistant division superintendent of the steel works, and became division superintendent of steel works in August, 1945, and he became general superintendent February 1, 1950.

★ ★ ★

At the same time **George A. Gleason,** Manager of Operations at Worcester, announced the appointment of **Wade B. Houk** as general superintendent of American Steel & Wire Division's South Works.

★ ★ ★

Mr. Houk, who has been division superintendent of South Works' wire mills, succeeds, Umbert F. Corsini who has been named general superintendent of the Steel & Wire Works of the American Steel & Wire Division in Donora, Pa.

★ ★ ★

A native of New Brighton, Pa., Mr. Houk was born there September 15, 1912, and graduated with a Bachelor of Science Degree in metallurgy from Pennsylvania State College in 1933.

★ ★ ★

His first employment with American Steel & Wire was in October of 1936 in the metallurgical laboratory in the Division's old North Works in Worcester, Mass. After several promotions in the metallurgical department at Worcester's North and South Works, he became assistant division superintendent of South Works' wire division in May of 1945. Two months later he was named department superintendent in cold roll, and on February 1, 1947, he was made division superintendent of the wire mill, a position he has held until now.

Watts Promoted by C. F. & I.

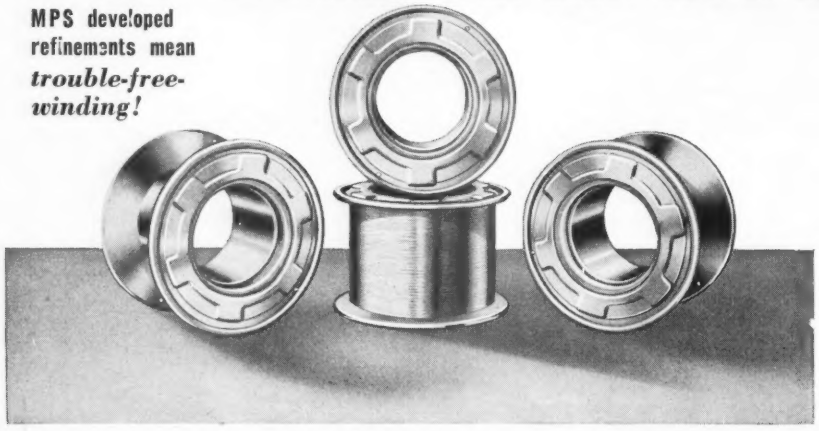
L. A. Watts has been named General Manager of Sales of the Eastern Division of **The Colorado Fuel and Iron Corporation,** it was

Spool Headaches Eliminated

when MPS. HEAVY DUTY NO-CREV SPOOLS

are used in the drawing of the finest wire at high speed

MPS developed refinements mean *trouble-free-winding!*



SIZES

* 6 x 3½ x 3½
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* Illustrated

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18 WEST STREET ATTLEBORO, MASSACHUSETTS, U.S.A. Telephone Attleboro 1-0847 & 1-0848

James Day (Machinery), Ltd., 28 Maddox Street, London, W. I. England #104

announced today by **H. C. Allington,** Vice President in Charge of Sales of the Eastern Division of Colorado Fuel and Iron.

★ ★ ★

Mr. Watts has been Assistant General Manager of Sales of the Wickwire Spencer Steel Division of Colorado Fuel and Iron since January 1, 1951.

★ ★ ★

Prior to his appointment as Assistant General Sales Manager, Mr. Watts, in 1950, established and managed the Pig Iron and Semi-finished Sales Department of the Wickwire Spencer Steel Division of Colorado Fuel and Iron. In 1949 he headed the newly-opened Detroit District Sales Office as Manager. In 1947, Mr. Watts was appointed Manager of the General Wire Sales Department.

★ ★ ★

A graduate of Northwestern University, Mr. Watts joined the then Wickwire Spencer Steel Company in 1938 as a chemist in the Buffalo Plant. He became successively Foreman, Assistant Superintendent and Metallurgist in the Buffalo Wire Mill.

U. S. Rubber Announces Sales Appointments

Five new assignments in the electrical wire and cable department of **United States Rubber Company** have just been announced by **Howard H. Weber,** sales manager of the department, and are effective immediately. Three of the assignments are in New York City, and the others in Atlanta, Ga. and Philadelphia, Penna.

★ ★ ★

John Blake has been made manager of state and municipal sales, and E. T. Corbus has been named manager of electrical utilities sales. Both are located at U. S. Rubber Company's headquarters at 1230 Avenue of the Americas, New York 20. J. W. Loveland, located at the New York branch at 191 Hudson Street, is now eastern division sales manager, succeeding Mr. Corbus.

★ ★ ★

C. R. Pickens will be the southeastern division sales manager, located at Atlanta, and H. J. Cluver will be the middle-Atlantic division sales manager, with headquarters at Philadelphia.

To Head Department for Carboloy

William A. Reich has been appointed manager of Advance Development Engineering at the **Carboloy Department of General Electric Company** in Detroit.

★ ★ ★

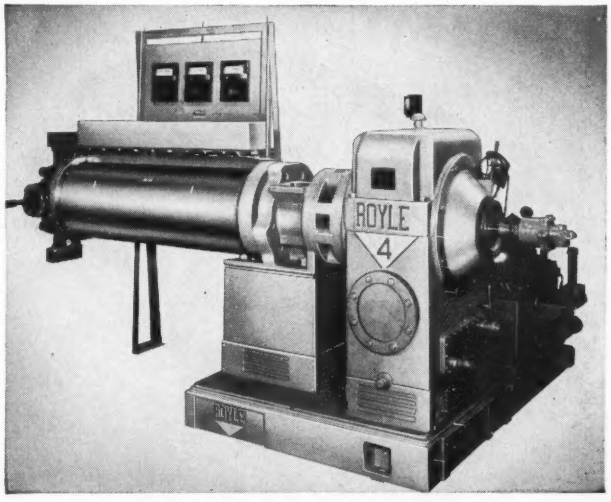
For the past seven years, he has been engineer in charge of the metallurgy section of General Electric's Turbine Division Laboratory in Schenectady.

★ ★ ★

Mr. Reich is a graduate of the Carnegie Institute of Technology. After graduation, he joined the G. E. research laboratory and worked there for a year prior to moving to the Turbine Laboratory in 1938.

ROYLE
SPIROD* EXTRUDERS

Built by America's oldest builders of extruding machines Royle Spirod extruders are the result of more than seventy years experience in the design of extruding machines. Time tested and proven features are built into Royle Spirod extruders to assure maximum productivity at minimum operating cost. These features include: Heavy steel members without flanges . . . Spirally installed rod type heating elements to provide faster, steadier, more evenly distributed heat . . . Complete insulation of cylinder and head to reduce heat loss with substantial power savings . . . Separate heating zones controlled by proportioning instruments.



CHECK THESE FEATURES that assure profitable and trouble-free production of such items as plastic insulated wire, flexible and rigid pipe, plastic sheeting, plastic clothes line, to mention a few of the products that are produced daily with Royle Spirod extruders.

*Patent Applied for

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — REgent 2430
Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262
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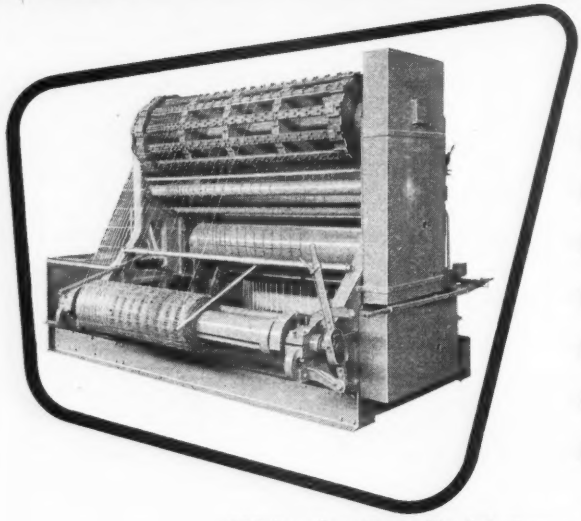
PATERSON 3, NEW JERSEY

Interlocking FENCE LOOMS



- Fastest — Most Efficient
- Preferred by Leading Mills
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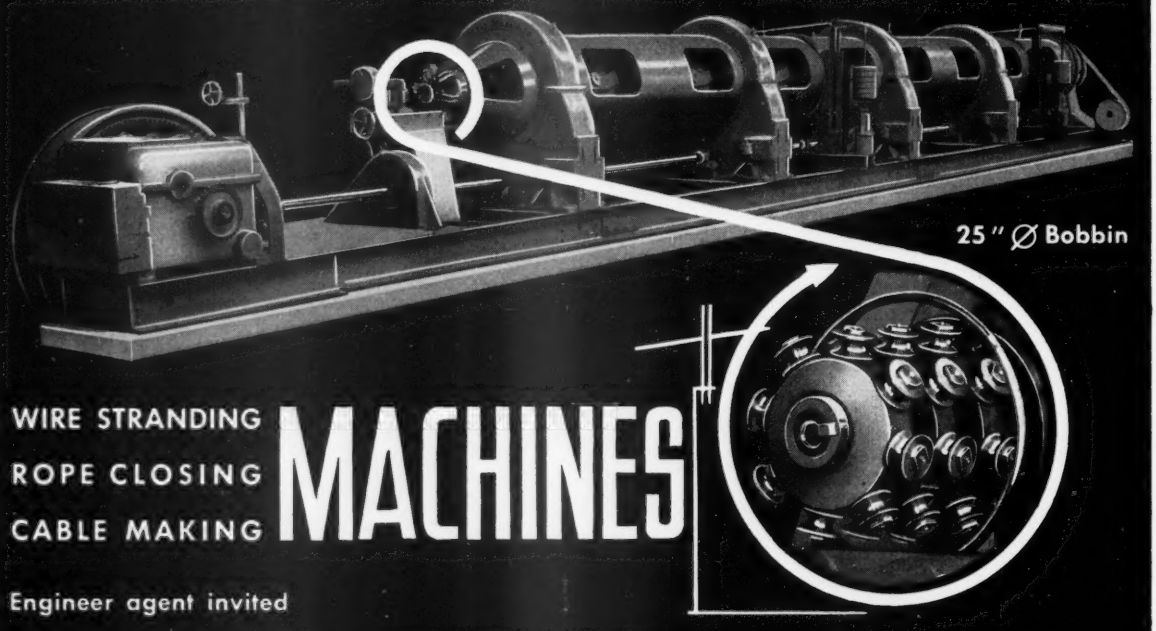
- Wrapped Stay Fence
- Straight Stay Wires
- Integrated — Space Saving
- Replaceable Main Bearings
- Single or Double Strands
- Years of Low Cost Production

Write for Detailed Information — Without Obligation

Interlocking Fence Co., Box M8, Morton, Ill.

Specialists In Fence Looms

NIEHAUS High-Speed Tubular Stranding Machine



WIRE STRANDING
ROPE CLOSING
CABLE MAKING

MACHINES

Engineer agent invited

MASCHINENFABRIK K. A. NIEHAUS · GERMANY
DÜSSELDORF-RATH

In New Post with Jones & Laughlin

John E. Griffith has been named assistant chief industrial engineer of Jones & Laughlin Steel Corporation.

★ ★ ★

Mr. Griffith, an industrial engineering graduate of the University of Pittsburgh, joined J. & L. in 1936 and served at the Aliquippa, Pa., works division. He has been on the staff of the chief industrial engineer in the J. & L. central office since 1944.

Anaconda Sales Appointments

Ross A. DeMatteo, 2nd, Anaconda salesman in the Washington district sales office for the last several months, has been transferred to the New York office of Anaconda Wire & Cable Co.

★ ★ ★

Mr. DeMatteo came to the company in 1947 and was appointed a Sales Engineer, after having completed an extensive training course. Latterly he has been assisting Anaconda's government representative in Washington.

★ ★ ★

James P. Ruch, salesman in the Kansas City office, has been transferred to the company's Detroit office, located at 714 New Center Building, Detroit 2, Michigan.

★ ★ ★

Bruce Van Wagner has rejoined the Anaconda sales organization, and has been assigned to the New York district office, 25 Broadway.

Chain Belt Promotes Three Men

Chain Belt Company of Milwaukee announces three personnel appointments affecting the operations of its Baldwin-Duckworth Division.

★ ★ ★

Edward M. Rhodes has been named Assistant to the General Manager of the Baldwin-Duckworth Division; **Roland V. Poisson** has been appointed Assistant Sales Manager of the same Division; and **William E. Kennedy Jr.** has been named Supervisor of Duckworth Automotive Timing Chain Sales.

★ ★ ★

Chain Belt Company of Milwaukee is a leading manufacturer of sprocket and process equipment, and construction machinery. Its products are marketed under the trade names of Rex and Baldwin-Rex: — the Baldwin Chains and Duckworth Timing Chains.

Made Sales Executive by Union Drawn Steel

Appointment of **Hugh S. Terrell** as assistant manager of sales for the **Union Drawn Steel Division of Republic Steel Corporation** has been announced by **Norman W. Foy,** general manager of sales for Republic.

★ ★ ★

He succeeds Henderson E. McPherson, who has been transferred to Republic's Pittsburgh district sales office and is now sales manager there. Mr. Terrell will continue to make his headquarters in

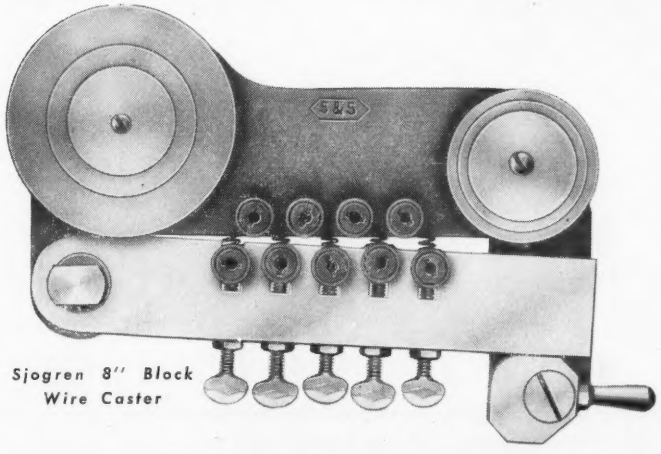
Sjogren KILLERS for Casting Wire

SJOGREN Killers are designed for the job — that of 'casting' wire properly. The 8" block size will handle from .005" to .020" diameters. Other Sjogren killers for larger wire gauges and blocks of greater diameter, having either clockwise or counter clockwise rotation, are made to order.

Used by Wire Men Who Want the Best!

SINCE S&S 1927

WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS



Sjogren 8" Block Wire Caster

SJOGREN TOOL AND MACHINE CO., INC.

Tools for The Wire Industries

14 SWORD STREET, AUBURN, MASSACHUSETTS

Represented in Canada by THE LARSON CO., 98 Wellington St., West, Toronto, Ont

Massillon, Ohio, at the Division's general offices.

★ ★ ★

A native of New Brighton, Penna., Terrell has spent his entire business career in the sales department with Union Drawn. He joined Union Drawn as a sales clerk in 1923 and was named chief clerk in the sales department in 1939.

Boak Re-elected President of Plume and Atwood

Directors of the **Plume & Atwood Manufacturing Company** have announced that a three-year contract has been signed by Thomas I. S. Boak retaining him as the company's chief executive. His present contract for the office of presidency expired early in February. Mr. Boak was formerly works manager of the **Winchester Division of Olin Industries** in New Haven. He held the position for 18 years prior to coming to Waterbury and to the Plume & Atwood Company.

★ ★ ★

In a statement released by Robert H. Keane, public relations director, it was stated: "The directors of this company were unanimous in their praise of Mr. Boak's record. They cited the company's progress since he assumed the responsibility of reviving a virtually bankrupt organization three years ago. The last published financial statement reflecting a profit in excess of a half million dollars was pointed to as a tangible result of his stewardship and efforts.

★ ★ ★

The Plume & Atwood Company is presently involved in the longest strike in the city's history. It is continuing production despite the fact that some 200 of its employes, affiliated with the CIO United Auto Workers Union, have been on strike since last June. The strike is entering its 29th week with little encouragement of settlement.

Appointed West Coast Distributor

Standard Wire and Cable Co., 3440 Overland Ave., Los Angeles, Cal., which started jobbing electrical wire and cable products just eight years ago, has been awarded another important Southern California distributorship.

★ ★ ★

George Rolfe, president of **Hitemp Wires, Inc.,** of Mineola, Long Island, N. Y., pioneer manufacturers of Teflon insulated wires, announced recently that the Los Angeles firm has been chosen as Southland distributor for its products.

★ ★ ★

"Hitemp" magnet wire insulated with Teflon, a high temperature insulation, will be exclusively handled in this area by Standard Wire and Cable Co., Rolfe stated.

Harold Cope Moved to Duluth

Harold Cope, general superintendent of **American Steel & Wire Division's Steel & Wire Works** in Donora, Pa., has been named manager of operations of the Division's Duluth district, it was announced by **Van H. Leichliter,** new vice president of this United States Steel Corporation Division.

★ ★ ★

WIRE SPOOLS, ALL-STEEL, LITHOGRAPHED

Ends and traverses may be shipped separately and assembled easily in your plant on a hand, foot, or power press.
5" and 6½" diameter ends with 1-15/16" diameter traverses.
10½" diameter ends with 3½" diameter traverses.
Traverse lengths up to 12".

J. L. CLARK MANUFACTURING CO.
600 23rd AVENUE • ROCKFORD, ILLINOIS

In assuming his new post in Duluth, Mr. Cope takes over the position of **John A. Slenker,** whose promotion to assistant vice president of operations was announced recently.

Added to Engineering Staff by Sprague

Gilbert B. Devey has been appointed to the Application Engineering staff of the **Sprague Electric Co.,** North Adams, Mass., it has been announced by Julian K. Sprague, vice president. Mr. Devey will coordinate Sprague's application engineering efforts on printed circuits and ceramics.

★ ★ ★

Mr. Devey comes to Sprague from the Office of Naval Research, Washington, D. C., with which he had been associated since 1949. He was previously with other branches of the Navy Department, specializing in electronic circuitry. Mr. Devey has been a Steering Committee member of the Annual Symposium on Improved Quality Electronic Components, in Washington, D. C.

Wilson Named to New Sales Post

O. B. Wilson has been named industrial instruments sales manager for the **Industrial Division of Minneapolis-Honeywell Regulator Company,** Philadelphia, it was announced by L. Morton Morley, vice president.

★ ★ ★

Mr. Wilson's assignment to the newly created post is part of a long-range integrated program to implement the company's sales organization to meet the increased complexities of the firm's industrial marketing problems, Morley said.

★ ★ ★

He joined Honeywell in 1923 and served as industrial manager in Chicago, New York and other offices. In 1948 he was made industrial manager for the eastern sales region. Early last year Wilson was named field sales manager for the Industrial Division.

To Manage Bohn's Adrian Plant

The Bohn Aluminum & Brass Corp. has announced the appointment of **A. J. Hirons** as manager of its Plant No. 24 at Adrian, Mich.

Made Chief Metallurgist Crucible Steel's Syracuse Plant

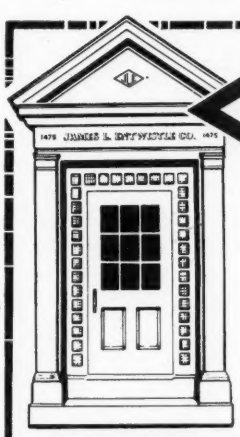
Eugene A. March has been appointed chief metallurgist for **Crucible Steel Co. of America's** Sanderson-Halcomb Works in Syracuse, N. Y. He succeeds **David I. Dilworth Jr.,** who has made assistant director of metallurgy.

Scovill Announces Appointments to Zipper Division Sales Staff

Paul E. Fenton, vice president in charge of manufactured sales of the Scovill Manufacturing Company has announced the appointment of two new district sales managers in the zipper division. They are Hayden R. Hotchkiss, New York City, and W. Edward Ashwell, Chicago, Ill.

★ ★ ★

The Scovill Company recently expanded its line of zippers to meet demands from the wearing ap-



JLE

SERVING THE WIRE INDUSTRY THROUGHOUT THE WORLD

- Caterpillar Pull-outs
- Standard Sets of Spark-Testing Equipment
- Take-ups and Re-spoolers
- Reelers
- Coilers
- Spoolers
- Collapsible Coiling Reels
- Wire Sparkers and Accessories
- Hand Locators
- Electrode Units and Stands
- Measuring Machines, Counters and Accessories
- Wire Guide Units
- Pay-off Reels Stands
- Electronic Devices
- Shaftless Take-ups and Payoffs
- Wire Pre-Heater
- Disk Brakes and Controls, Drag Units and Slip Clutches
- Wire Marking Machines, Type Strips, Inks
- Labelling Machines
- Pneumatic Equipment and Controls
- Special Machinery for the Wire Industry
- Hydraulic Equipment and Controls
- Hi-Pot Test Sets
- Cable Handling Equipment for Warehouse Use

See page 256 for News of JLE Automatic Dual Take-up

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JLE JLE JLE JLE JLE

parel and rubber trades. Its "Gripper" zipper line has been meeting with marked success.

★ ★ ★

Mr. Hotchkiss has been a member of the Scovill sales staff since 1934 and was assigned to the Virginia office, serving the Southern territory. He served in World War II and was discharged with the rank of lieutenant colonel. On his return to the Scovill service he was assigned to Washington to maintain contact with government agencies and the Armed Forces, particularly those federal departments concerned with controlled materials.

★ ★ ★

Mr. Ashwell, a native of Evanston, Ill., joined the Chicago sales office of Scovill's in 1948. He had previously served with Archer Mills, Inc., Columbus, Ga.; Talon, Inc., Meadville, Pa., and the Chicago investment firm of Frank G. Wright & Company. He will continue to serve Scovill's in the Mid-West.

Phelps Dodge Executive Made Director of Electrical Apparatus Concern

E. P. Dunlaevy, Vice President of **Phelps Dodge Copper Products Corporation** has been elected a member of the Board of Directors of G & W Electric Specialty Company whose headquarters are in Chicago. The company manufactures electrical apparatus including terminals, joints, and other accessories for high voltage cable systems.

★ ★ ★

Mr. Dunlaevy is also a Director of the Christiania General Insurance Company and a Trustee of the New York Savings Bank.

Elected Director of International Paper

Percy J. Ebbott, President of the Chase National Bank, was elected a Director of the **International Paper Company** recently, it was announced by John H. Hinman, President. His election fills the vacancy caused by the resignation, effective January 19, 1953, of Winthrop W. Aldrich, former Chairman of the Chase National Bank and now U. S. Ambassador designate to Great Britain.

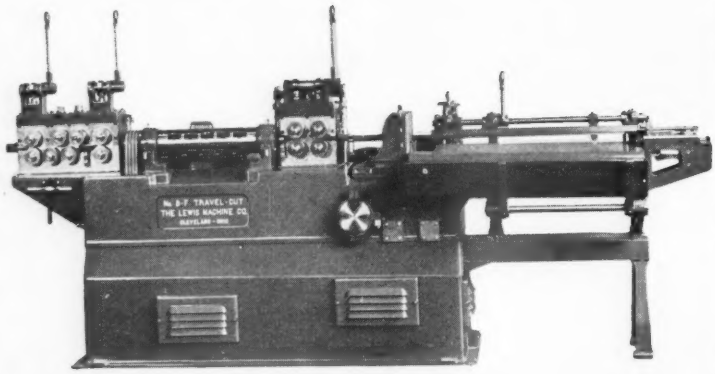
★ ★ ★

Mr. Ebbott has been associated with the Chase National Bank and its predecessors for the past forty years and has been president for the past four years. He is a director of Allied Stores Corp., Moore-McCormack Lines, Inc., Nash-Kelvinator Corp., and Belding-Heminway Company. A graduate of Oberlin College, Oberlin, Ohio, he serves as a life trustee of that institution.

Fast, Accurate, Economical

STRAIGHTENING and CUTTING

with LEWIS TRAVEL-CUT



22 Models to handle from 1/16" to ¾" Round, Hex, Flat, Shapes.

Simple in design, rigid in construction, Lewis TRAVEL CUT will deliver continuous dependable service under the most severe, high production conditions—day in, day out. Feeds wire from the coil, straightens accurately, gauges to uniform length, and cuts clean without stopping the wire. For steel, brass, aluminum and alloy wire. Cut your cutting costs with the Lewis TRAVEL CUT. Full details on request.

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CENTRAL: Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

WEST COAST: Hoffman & Heartt, 3005 So. Grand Ave., Los Angeles 7, California.

CANADIAN: Empire Engineering Co., 11 Wellington St. E., Toronto 1, Ontario.

CONTINENTAL EUROPE: Gaston E. Marbaix Ltd., Devonshire House Vicarage Crescent, London S. W. 11, England.

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A Review of Recent Wire Patents

No. 2,624,270, MACHINE FOR WIRE BINDING BOXES OR THE LIKE, patented January 6, 1953 by Thomas R. Sykes, Toronto, Ontario, Canada, assignor to The Toronto Star Limited, Toronto, Ontario, Canada.

There are twelve claims to this patent for a machine which will tension the trapped wire while its ends are being welded together.

* * *

No. 2,624,374, MACHINE FOR MAKING ELECTRICAL COILS, patented January 6, 1953 by James S. Burge, Anderson, Hilton J. McKee, Middletown, and Richard Marcus Goodwin, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware.

A coil winding machine is described and covered by twenty claims.

* * *

No. 2,624,375, WIRE TYING MACHINE, patented January 6, 1953 by Kurt Eric Schulze, San Francisco, Calif., assignor to Ernest Roe, doing business as Coast Wire Company, San Francisco, Calif.

The machine is adapted for securing the ends of wire encircling an object by twisting the wire, cutting the ends and disposing the ends beneath the twisted portions thereof.

* * *

No. 2,624,376, LOOP FORMING TOOL FOR HELICAL SPRINGS, patented January 6, 1953 by Joseph Leigh Smith, Glen Ellyn, Ill.

More specifically the tool is for forming a center loop.

* * *

No. 2,624,377, HOOK FORMING TOOL FOR HELICAL SPRINGS, patented January 6, 1953 by Joseph Leigh Smith, Glen Ellyn, Ill.

A bench tool is disclosed for this purpose.

* * *

No. 2,624,526, WIRE PACKAGE, patented January 6, 1953 by Frank A. Green, Islip, N. Y., assignor to Chicago Steel and Wire Company, Chicago, Ill., a corporation of Illinois.

A temporary reel for wire is disclosed whereby the wire and reel may be shipped, etc., and the wire subsequently mounted on a permanent reel.

* * *

No. 2,624,777, INSULATED ELECTRICAL CONDUCTOR, patented January 6, 1953 by John F. S. Abbott, West Barrington, and Charles J. Tappero, Bristol, R. I., assignors to United States Rubber Company, New York, N. Y., a corporation of New Jersey.

About the wire conductor is an insulating layer of inflammable rubber, next a layer of polychloroperene, next a continuous jacket of nylon and an outer, thin, dry, flexible, continuous, non-tacky and non-stocky coating of a homogeneous mixture of an unhalogenated solid polymeric alkyl aryl silicone resin and an unhalogenated non-volatile polymeric alkyl aryl silicone fluid.

* * *

No. 2,625,340, WIRE COILING APPARATUS, patented January 13, 1953 by Phineas A. Beaman, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass., a corporation of Massachusetts.

The apparatus is adapted to receive and coil wire of sharp-cornered cross sections.

* * *

No. 2,625,495, HIGH-TEMPERATURE CLEANING OF FERROUS METAL, patented January 13, 1953 by Carroll Cone and Jack Huebler, near Toledo, Ohio, assignor to Surface Combustion Corporation, Toledo, Ohio, a corporation of Ohio.

A method of cleaning ferrous metal whose surface carries carbonaceous matter and iron oxides is disclosed and comprises the step of exposing said metal at a temperature of 670° F.-1700° F. to an atmosphere that contains both (1) a gas that is oxidizing to carbon and (2) a second gas that is deoxidizing to iron oxides, and so adjusting the length of time of such exposure and the concentrations of gas (1) and of gas (2) in the atmosphere during such exposure that complete removal of both the carbonaceous matter and the iron oxides is accomplished simultaneously.

* * *

NRM EXTRUDERS
Give you
FASTER, BETTER WIRE COVERING

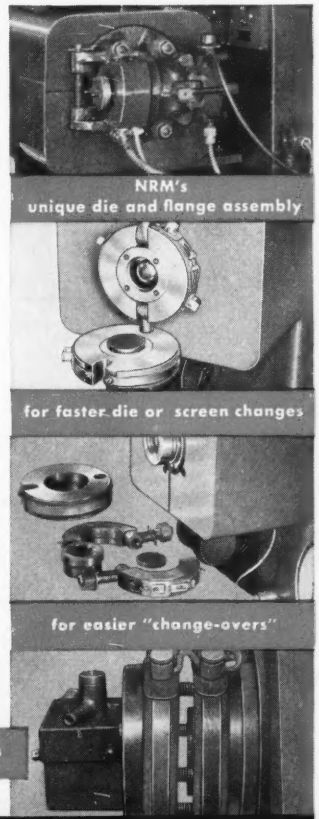
That's right!! NRM extruders have many features designed to give you faster, better covering of wire with plastics.

Take, for instance, NRM's die and front flange assembly—an exclusive feature—engineered to save you time, money, and effort—designed to give you better extrusions through exacting heat control.

Simple and sturdy . . . this assembly swings open quickly — dismantles easily — permits faster die and screen changes and easier "change-overs" from one plastic to another.

Furthermore . . . both the die gate adapter and the flange carry exterior band heaters which eliminate critical heat losses and give more uniform extrusions. For Nylon extrusions, the flange can be completely removed and the Nylon die or crosshead, with heaters, mounted directly on the cylinder face. Such a mounting also permits controlled heating and exact extrusions.

NRM's unique die assembly is now available on its 1½", 2½" and 3½" electrically heated plastics extruders. Write, today, for more information on this and all the features of NRM extruders.



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West: S. M. Kipp, Box 441, Pasadena 18, Calif.
Export: Omni Products, 460 4th Ave., New York 16, N. Y.

Creative Engineering

No. 2,625,636, APPARATUS FOR CRIMPING HELICAL SPRINGS IN INTERSPRING CONSTRUCTION, patented January 13, 1953 by Joseph Gauei, Jersey City, and Aloysius J. Quinn, North Bergen, N. J., assignors to Comfort Spring Corporation, Baltimore, Md., a corporation of Maryland.

More specifically, the crimping is so effected that the helical has a free end extension from the springs engaged thereby.

★ ★ ★

No. 2,625,961, WIRE NETTING MACHINE, patented January 20, 1953 by Frank Bergandi, Los Angeles, Calif.

The machine is adapted to form simultaneously pairs of flat helical coils of wire as used in fence wire netting.

★ ★ ★

No. 2,625,962, SPRING ASSEMBLING MACHINE, patented January 20, 1953 by Edward L. Bronstien, St. Paul, Minn., and John Norman Woodington, Chicago, Ill., assignors to United States Bedding Co., St. Paul Minn., a corporation of Minnesota.

This is said to be an improvement upon the machine of patent 2,351,659 of June 20, 1944 so as to convert that manually-operated machine into a semi-automatic operated one.

★ ★ ★

No. 2,625,963, SPRING ASSEMBLING MACHINE, patented January 20, 1953 by Edward L. Bronstien, St. Paul, Minn., and John Norman Woodington, Chicago, Ill., assignors to United States Bedding Co., St. Paul, Minn., a corporation of Minnesota.

Here the invention resides in pneumatic actuating mechanism for use with a spring assembly machine having clamping bars and a tie-wire trimming mechanism, which pneumatic actuating mechanism operates the clamping bars and the tie-wire trimming mechanism.

★ ★ ★

No. 2,626,223, SYNTHETIC RESIN AND INSULATED PRODUCTS PRODUCED THEREWITH, patented January 20, 1953 by Frank A. Sattler, Pittsburgh, Jack Swiss, Murrysville, and James G. Ford, Sharon, Pa., assignors to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania.

About the wire conductor is insulation including the reaction product of polyesteramide and complex resinous epoxide.

★ ★ ★

No. 2,626,224, CLEANING OXIDE FROM OXIDIZED MOLYBDENUM WIRE, patented January 20, 1953 by Marie A. Levesque, Peabody, Mass.

The method comprises dipping said wire into a solution of nitric acid, removing the wire from the solution, dipping it into a solution of hydrochloric acid while the wire is still wet with the nitric acid solution, removing the wire from this last solution and washing the wire with water.

★ ★ ★

No. 2,626,302, CABLE WITH WEAKENED STRIPPING PLANE, patented January 20, 1953 by Thomas K. Cox, Randallstown, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

An electrical cable is disclosed which comprises a number of individually insulated, bunched-together conductors, and an outermost jacket, enclosing the conductors and having a weakened, sealed portion extending along one of the conductors and extending radially toward this one of the conductors from the exterior of the jacket.

★ ★ ★

No. 2,626,765, WIRE GUIDING DEVICE, patented January 27, 1953 by John M. Biddison, Dayton, Ohio, assignor to Harry W. Moore, Dayton, Ohio.

The device is for use with a reeling mechanism. There are fourteen claims.

Push Search for Nickel

Throughout the world the search for new deposits of nickel is being pushed at an unprecedented rate. This exploration work, both time-consuming and costly, is being carried on by interests new to the industry as well as by the established producers. In Canada, particularly, the wave of prospecting which is opening up new areas is attracting considerable attention to the country's untapped mineral resources. Most of this work is being financed by private capital, but some of it is being done with the financial assistance of the United States and other governments.

EW

HIGH PRODUCTION METAL LOOMS

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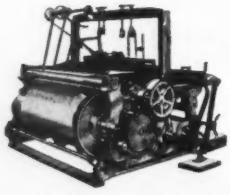
Type BM for mosquito & fly nets, paste factories, armour plate glass, corn sieves, etc.

Type XL for flour mills, chemical and industrial works, etc.

Type CP for "Rabitz" cloth, plastering work, armour plate glass, etc.

Type CM for extra strong metal cloth for sieves, grain, rice, armour plate glass.



Jarach-Guetta, Industrial Overseas Co., Inc.

120 Wall Street, New York 5, N. Y.

General Agents of EMILIO WARTENWEILER,
Via Pergolesi 18, MILAN (Italy)

Symposium on Determination Of Elastic Constants

The revival of interest in recent years in the determination of elastic constants has indicated a need for more accurate knowledge of known elastic constants and their extension to extreme temperatures, and for new techniques covering such relatively new materials as plastics and composite materials.

★ ★ ★

In recognition of these problems the Task Group on Elastic Constants of Committee E-I on Methods of Testing sponsored the present series of papers at the June 1952 Annual Meeting of the American Society for Testing Materials.

★ ★ ★

The symposium covered an analysis of returns from a questionnaire on the needs regarding elastic constants and on current practice in their determination; an ingenious static method for modulus determinations at elevated temperatures and its application to steels is described in the second paper; static and dynamic methods for non-metals are surveyed in the third; dynamic methods with their advantages and limitations are discussed in the fourth paper; and a comparison of values of elastic constants for a beryllium-copper alloy obtained by several static and dynamic methods.

The papers are as follows:

Report on ASTM Task Group for Determination of Elastic Constants—by Walter Ramberg.

The Influence of Temperature on the Elastic Constants of Some Commercial Steels—by F. Garofalo, P. R. Malenock, and G. V. Smith.

Methods for Determining the Elastic Constants of Nonmetallic Materials —by E. W. Kuenzi.

Dynamic Methods for Determining the Elastic Constants and Their Temperature Variation in Metals—by M. E. Fine.

An Evaluation of Several Static and Dynamic Methods for Determining Elastic Moduli—by John T. Richards.

★ ★ ★

Copies of this 110-page Symposium can be obtained from Headquarters of the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa. at $2.00 each in heavy paper cover.

★ ★ ★

Indian Company Celebrate 2nd Anniversary

One of India's newest wire enterprises, **Aluminum Industries, Ltd.,** of Kundara, has published an issue of its house organ "The Alind Chronicle," devoted largely to the happy fact that on its second birthday the company finds itself a successful going concern.

★ ★ ★

The company is making aluminum conductor cable and hopes soon to be able to supply all of India's requirements.

★ ★ ★

Appropriate ceremonies were held to mark the beginning of the second milestone, on which occasion it was noted that a healthy back-log of orders existed and the hope expressed that new levels of efficiency and higher standards of cooperation would be achieved in the second year.

THE 1953 WIRE & WIRE PRODUCTS

BUYERS' GUIDE

On sale April 10th. — Order to-day.
Price: $5.00; to subscribers $3.00; no extra charge to members of Wire Association.

WIRE AND WIRE PRODUCTS
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MEASURE FOOTAGE THE NEBUTTCO WAY

Nebuttco Wire Measuring Machines measure the footage of wire and cable, accurately, dependably. Built for heavy-duty, production service, these machines register the footage directly on an easy-to-read counter. Lengths up to 100,000 feet . . . nearly 19 miles . . . can be counted at one setting of the machine. Machines are supplied either with counter on right or left side, as needed, and are also available with electric predetermined counters.

Nebuttco Wire Measuring Machines are versatile, easily transferred from one job to another, easily adjusted to proper height for the job. Machine illustrated is made in two sizes — No. 1 for measuring wires to ⅝" diam. and No. 2 for wires to 1½". We also manufacture a small bench type machine for measuring any flexible material not over 5/16" diam.

For complete specifications ask for Circular No. 1

NEW ENGLAND BUTT COMPANY
1842
304 PEARL ST.,
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WAFIOS

WIRE-WORKING MACHINERY

Wire Netting Machines for Chain Link, Hexagonal Mesh, Poultry Netting, Field Fence. Crimping, Barb Wire and Staple Machines. Spring Coilers. Spring End Grinding Automatics. Loop Benders. Upholstery Spring and Wire Mattress Machines. Wire Nail Machinery. Chain Formers. Chain Welders. Straightening and Cutting Machines. Multi-Slide Wire and Strip Forming Machines. Special Machinery for the making of Paper Clips, Lock Washers, Bale Ties, Key Rings, Tin Openers, Wire Bag Ties, etc. Automatics for Flexible Metallic Tubing.

Sole Agents for Australia and New Zealand: Bliss & Reels Co. Pty. Ltd., 64-66 Little Bourke Street, Melbourne C. 1, Australia.

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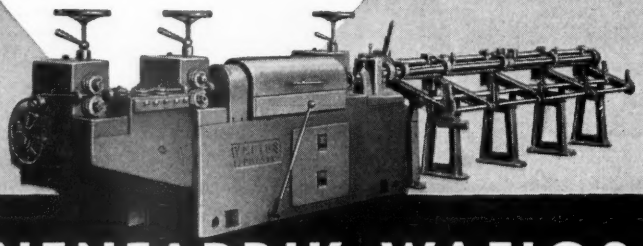

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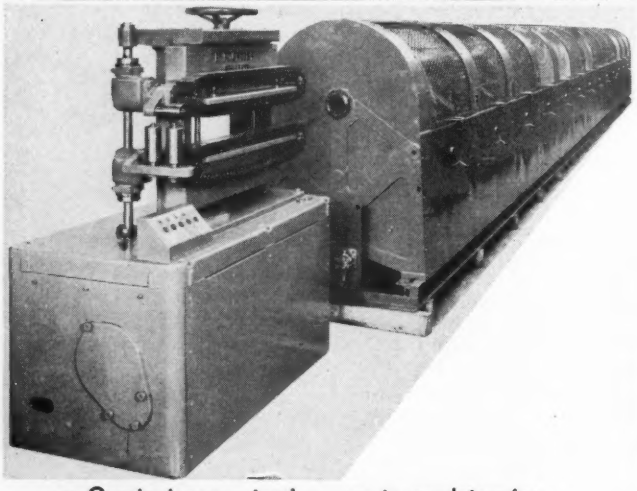
WAGNER, FICKER & SCHMID **REUTLINGEN 3 / WÜRTT. GERMANY**



- Constant paper tension easy to predetermine.
- Haul-off by our caterpillar, Maillefer patented.
- Lockheed braked on the head itself.
- Handling large drums.

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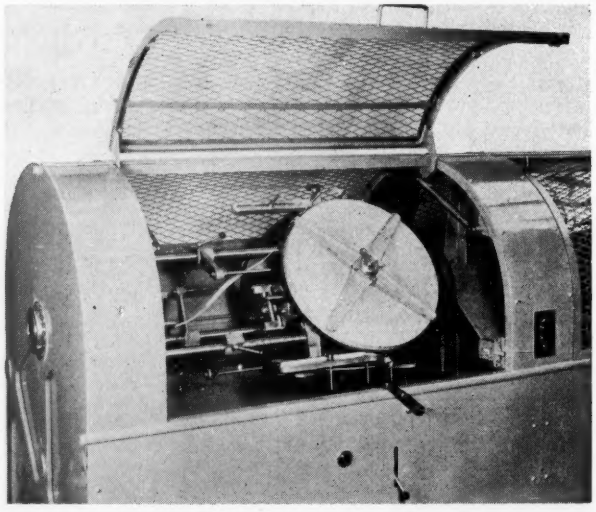
ARE YOU SURE YOU HAVE THE BEST TAPING MACHINE FOR LOW AND MEDIUM TENSIONS?

HERE IS OUR No. 8 MACHINE:

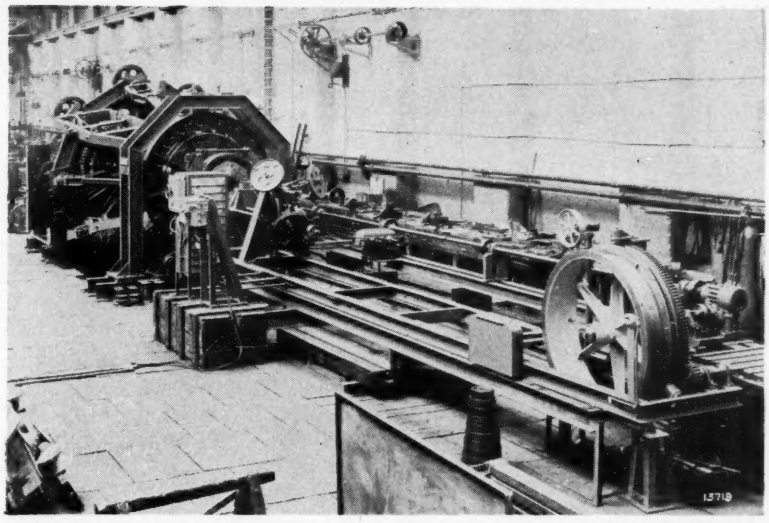
- 3" and 4" bore.
- 20" paper cheese diameter.
- 400 RPM.
- Automatic stop motion.



New Closing Machine Regulates Back Twist

Messrs. B. & F. Carter & Co. Ltd., of Albion Works, Bolton, England, have pleasure in presenting their new heavy type laying-up machine which incorporates many unique features, enabling a high production rate to be obtained with the minimum of setting-up time. The machine is fabricated in steel and the technique of deep penetration welding has been employed in its construction, giving increased strength and stability.

★ ★ ★



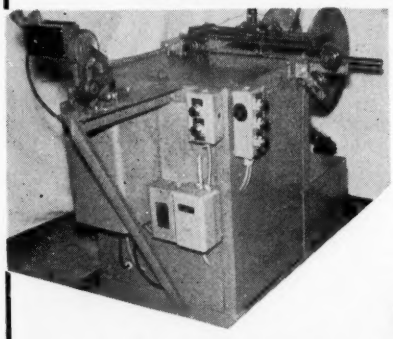
Showing lengthened base girder to take 3 x 8 Tangial Paper Lapping Heads at a later date.

The rotor has been designed to accommodate four drums, each 4'0" diameter x 2'0" traverse, also an additional 4 drums, 16" diameter x 9½" traverse for flexible earth conductors. Suitably spaced round the first cage support disc are 36 spindles for filler bobbins measuring 10" diameter x 10" traverse, the filler yarns being led under a ring to the die plate. The cores and earthing wires pass straight from their respective drums in the rotor to this plate, due to the fact, that the cradles have been mounted at a suitable angle for this purpose. This direct lead-in to the die prevents bending and possible distortion of the cores.

★ ★ ★

The illustration gives a general picture of the machine, showing clearly the taping head for 3 discs 18" diameter, driven through a P.I.V. variable speed gear, and the haul-off capstan complete with fleeting ring and reduction gear. The haul-off capstan is of the overhanging type, giving a clear

RE-SPOOLER



MACHINE SHOWN ABOVE DOUBLES PRODUCTION

ITS FEATURES ARE:

- VARIABLE SPEED
- CONSTANT FOOTAGE
- AUTOMATIC ACCELERATION
- PUSH BUTTON CONTROL
- ELECTRIC BRAKE
- TRAVERSE GIVES CONSTANT LAY WITHOUT GEAR CHANGES
- RIGHT OR LEFT HAND DESIGN

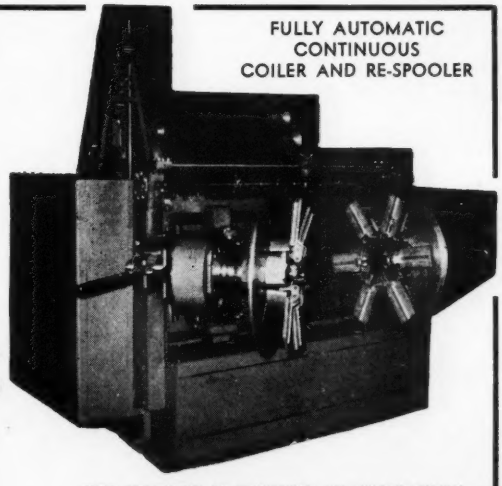
TWO RE-SPOOLERS YOU NEED FOR MAXIMUM PRODUCTION EFFICIENCY

BOTH ARE ELECTRONICALLY CONTROLLED

Our pattern shop and foundry facilities are available for repair of any type of wire equipment — at very low costs.

TRY US!

FULLY AUTOMATIC CONTINUOUS COILER AND RE-SPOOLER



THIS MACHINE IS COMPLETE IN EVERY DETAIL:

- ELECTRONIC CONTROLS
- CAPSTAN OPTIONAL
- ELECTRONIC TRAVERSE—THERE ARE NO GEARS
- AUTO RESET PREDETERMINED COUNTER
- ADJUSTABLE COLLAPSIBLE COILING HEADS
- REMOVABLE SHAFTS FOR RE-SPOOLING
- AUTOMATIC CUTTER
- SELF TYING

YOUR INQUIRIES ON THESE ECONOMICAL MACHINES ARE INVITED

WIRE INSULATING MACHINERY, Inc.

260 TOLLAND TPKE. (TEL: MITCHELL 2-2192) MANCHESTER, CONN.

"Engineered by men who know the business."

frontage on the working side.

★ ★ ★

In the rear of the machine, there is a motor drive and one of the two automatic air operated brakes mounted on the rotor shaft. A similar brake is mounted at the front of the machine as shown in the illustration. These brakes are automatic and operate when the electric circuit is broken, bringing the machine smoothly to a standstill. By adopting this method, undue torque is prevented. A separate motor and air compressor is provided to operate this braking system.

★ ★ ★

The planetary gearing is so arranged that the cores and earthing cables can receive one or two back twists or, alternatively, the drum cradles can be locked to provide zero back twist. The back twist is regulated by changewheels which are situated in a convenient position on the control side of the machine.

★ ★ ★

To effect the change-over from 3 to 4 core operation, or vice versa, special hemispherical seatings are provided for the cradles. It is only necessary to remove four nuts to free a complete cradle ready to be moved to the next position. These cradles are fitted with spherical bearings which are carried between the hemispherical seating of the removable cap and a similar seating in the rotor disc. By this method, the changeover can be effected in an hour or so and it is no longer necessary to slide back the rotor discs, an operation which previously required days to complete. The angular setting of the cradles can be altered by removing the split aluminium spacing collars, putting the back twist pinion out of mesh, and re-meshing in the desired position. This illustration also clearly indicates the angle of the cradle towards the closing die, already mentioned above, and also affords a good view of the welding construction, both of the discs and the cradles. On the side of the latter will be noted the special locking device for the drum width adjustment eliminating drum slap when narrow drums are used.

★ ★ ★

Reverting to the illustration, the space shown between the taping head and the haul-off capstan has been reserved, on this particular machine, for three tangential paper lapping heads, each carrying 8 discs of paper 16" diameter x 2" traverse and controlled by variable speed gear. The control for regulating the speed of the paper lapping head is situated on the working side of the machine, near the rotor regulator and starter. The speeds of these heads can be varied from 120 to 180 revolutions per minute.

★ ★ ★

The main drive is by 45 **h.p.** variable speed motor and centrifugal clutch which ensures smooth starting and provides for speeds variable from 12 to 25 revolutions per minute of the rotor, in forward or reverse rotation, con-

M R+P
SINCE 1870
A New Universal Automatic Multi-Slide Bending Machine
suitable for the fully automatic, economical mass production of all types of components from wire and strip material.
Special Features:
• Vertical, enclosed construction, requiring the minimum of floor space.
• Positive and direct control of the bending slide, ensuring high output and trouble-free operation.
• Accurate material infeed by special gripping mechanism.
• Simple tooling, easily adjusted and changed.
• Additional slides for special shapes can be fitted.
• Extra attachments for piercing, blanking and embossing.
Our special leaflet giving details on the range of application of our automatic multi-slide bending machines is available on request.
MEYER, ROTH + PASTOR
MASCHINENFABRIK G.M.B.H.
KÖLN-RADERBERG / GERMANY

trolled by the rotor regulator and starter.

★ ★ ★

Haul-off capstans of various sizes can be supplied and also take-up drum stands to suit all sizes of drums. The measuring machine situated above the haul-off capstan is arranged with an Albion 5 figure revolution counter with zero setback and can be supplied to record either in yards or metres.

★ ★ ★

The manufacturers would be very pleased to supply any additional information upon request.

New Southern Servicing Center For Scott Testers

Scott Testers, Inc., Providence, announce the appointment of Scott Testers (Southern) Inc., 216 Reidville Road, Spartanburg, S. C. as the authorized source of servicing, repairs, supplies and parts for Scott testing equipment in use in textile mills and other industries in the southeast. This appointment is effective March 1, 1953.

Scott Testers (Southern) will maintain a complete stock of factory-made parts and supplies. Its facilities include a machine shop capable of completely rebuilding Scott Testers.

★ ★ ★

The establishment is under the direction of John Hargreaves, and will be staffed with factory-trained personnel available to travel to the mills for such servicing as can be done there—or for transporting equipment to the shop for servicing, rebuilding and modernization more extensive than it is advisable to perform within the mill. Conversion of existing equipment to the new Scott "Accr-O-Meter" Constant-Rate-of-Extension Weighing System can also be accomplished by this personnel.

★ ★ ★

It is hoped that Scott customers in North Carolina, South Carolina, Georgia, Alabama, eastern Tennessee, eastern Mississippi and southern Virginia will avail themselves of this nearby and complete source of service, parts and supplies.

Spool Manufacturer Celebrates Thirty-fifth Anniversary

The North Waterford Spool Company, located in the heart of the source of supply of white birch, their raw material for wood spools, is taking note of its thirty-fifth milestone this year.

★ ★ ★

The company was organized in 1917, but since their first wood spools were not manufactured until 1918, they date their business history from the latter. Their plant is in North Waterford, Maine, at which point they turn out large quantities of small, accurately made wood spools used principally for the retail merchandising of wire.

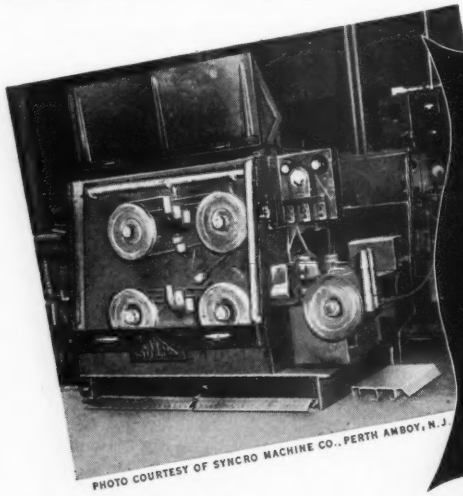
★ ★ ★

Mr. Earl D. Brown, President, states that unlike many other mills that specialize in the manufacture of small spools turned to accurate tolerances, they have remained independent and thus in a better position to cater to the exact needs of wire manufacturers and converters. He believes they are ren-

dering a unique service to that portion of the wire industry interested in retail wire sales and expresses his appreciation for the fine patronage of our industry that has made his first thirty-five years of business both pleasant and profitable.

Folder Describes Use, Sizes, and Manufacturing Processes for Alloy Metal Wires

The Alloy Metal Wire Company of Prospect Park, Pa., has published a folder showing clearly all the steps in the manufacture of quality alloy metal wire. Included in the folder are a series of photographs depicting uses of Alloy Metal wires of various compositions. Among these are such products as welding rods, wire for automatic welding equipment, electronics equipment, woven wire cloth, spring and various consumer applications in jewelry, kitchen equipment, etc. At the end of the folder, there is a brief description of the new group management plan recently instituted at the Alloy Metal Wire Company. Copies are available without charge from the Alloy Metal Wire Company, Inc. Prospect Park, Pa.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NOPCO's
DURPON*
Drawing Compounds
give
TWICE THE SERVICE
you can expect from
conventional compounds

Nopco's DURPON drawing compounds—specifically developed for wet drawing of nonferrous wire, rods and tubes—are all on the alkaline side, to assure optimum die life, and are natural lubricants.

But the special advantage these improved compounds offer is *emulsion stability*. For incorporated into each Durpon product is a stabilizing additive which prevents breakdown of the effective drawing ingredients when the bath becomes contaminated by dirt, small amounts of carry-over acid and metallic particles.

Because Durpon additives help maintain normal balance between soap and lubricant, the stability of the drawing emulsion during recirculation is increased and the useful life of the emulsion lengthened.

As a matter of fact, Nopco® Durpon compounds not only provide optimum lubrication, but retain their initial degree of performance for *twice as long* as conventional compounds.

If you draw nonferrous materials, Durpon compounds will assure you *better drawing results* and *reduced drawing costs.*

Immediately available are:

DURPON
for intermediate gauge wire

DURPON L
for heavy wire, rods, and tubes

DURPON FW
for fine wire

Fill out and mail the coupon. We'll send you a technical bulletin and trial-size order promptly.

®Reg. U.S. Pat. Off. *Trademark

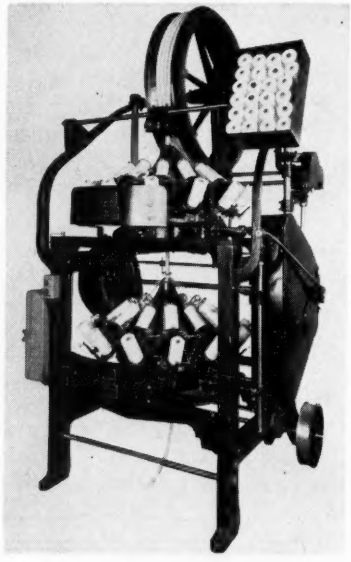
NOPCO
EVOLVED THRU RESEARCH
NOPCO
CHEMICAL COMPANY
Harrison, New Jersey
BOSTON · CHICAGO · CEDARTOWN, GA. · RICHMOND, CALIF.

NOPCO CHEMICAL COMPANY, Harrison, New Jersey
Gentlemen: Please send me a copy of your Bulletin giving information about Nopco DURPON Drawing Compounds.
Name.....Title.....
Company.....
Address.....
City.....Zone.....State.....

New Double Deck Cable Braider Now In Production

The new 24-24 Carrier Double Deck Cable Braider manufactured by **Wardwell Braiding Machine Co.** of Central Falls, R. I., is now in production and has already been the subject of excellent production reports.

★ ★ ★



The two heads of this new machine are standard, each having 24 carriers, with a 1¾" beater opening. Any size material that will go through the braider head can be accommodated by the capstan. The frame is rugged cast iron with steel supports for motor and braider head. The drive for the windup has a 12" pulley. The drive-shaft clutch is the well-known Maxitorq clutch of superior efficiency and durability. The complete unit is driven by a G.E. adjustable speed A.C.A. motor that gives great flexibility in operation through dial control.

★ ★ ★

Versatility is an important feature in this cable braider. Each head is equipped with a set of change gears that are readily accessible. Therefore, it is possible to apply any desired number of picks per inch at each head.

★ ★ ★

When the braider is shipped, it

is ready to operate simply by connecting the power feed lines.

★ ★ ★

Complete information and price are available. Address Wardwell Braiding Machine Co., Central Falls, Rhode Island.

New Book on Tungsten

The Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. has just published a new book entitled "Tungsten—Its Metallurgy, Properties and Applications," by Colin J. Smithells.

★ ★ ★

It is the most comprehensive book in the English language on the metallurgy, chemical and physical properties, and industrial applications of tungsten.

★ ★ ★

The introduction gives an outline of the mineralogy of this important metal. The primary and secondary raw materials, their step-by-step treatment for the production of metallic tungsten, the working of tungsten for obtaining various ductile products, the metallographic structure of the pure metal, the influence of manufacturing operations on the physical properties of tungsten, the most important tungsten alloys and their industrial applications, chemical and spectrographic methods for the determination of impurities are among the many topics discussed in detail. The author enlisted the help of several experts for writing the chapters on the special phases of the subject.

★ ★ ★

The book contains 225 illustrations among them many photomicrographs. Numerous tables list many helpful data. It is well written and should be of considerable assistance to students and specialists alike. It sells for $8.50.

Rental Truck Plan Announced

A novel nationwide plan which permits users to lease industrial lift and fork trucks and allied equipment rather than buying them has been announced jointly by the **Philadelphia Division of the Yale & Towne Manufacturing Company,** and **C.I.T. Corporation,** the industrial financing subsidiary of C.I.T. Financial Corporation.

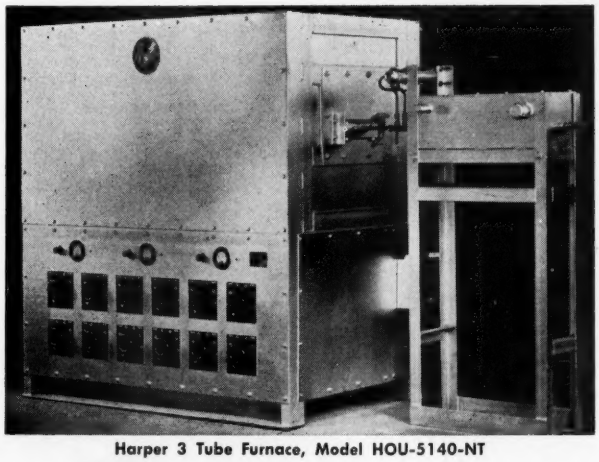
★ ★ ★

The new plan, placed in operation in January, enables factories, warehouses and others to obtain Yale materials handling equipment by paying monthly rentals as the machines are used. Under the program, the field sales organization of Yale & Towne's materials handling division at Philadelphia will negotiate leasing agreements for Yale equipment with potential users. C.I.T. will then purchase the required equipment from Yale & Towne and lease it to the user for an agreed period of time.

★ ★ ★

A corollary plan is also available for users who wish to purchase Yale materials handling equipment on installment terms rather than lease.

ECONOMICAL, EFFICIENT WIRE STRAND ATMOSPHERE ANNEALING WITH HARPER ELECTRIC STRAND ANNEALER.



Harper 3 Tube Furnace, Model HOU-5140-NT

Using one of these HARPER Annealers, a customer reports satisfaction, stating that its advantages to them are:

1. "Exceptionally uniform temperature throughout the entire heating zone;"
2. "Reliable trouble-free operation."

This furnace is used for annealing a high alloy stainless steel wire at temperatures of from 1750°F. to 2300°F., with the wire moving through at a speed of 8 FPM.

Such Continuous Strand Annealers are available in various sizes, with from 3 to 60 tubes in capacities to fit your requirements.

You are invited to consult Harper Engineers on your wire problems. Address inquiries to Dept. 12.

Harper

HARPER ELECTRIC FURNACE CORP.

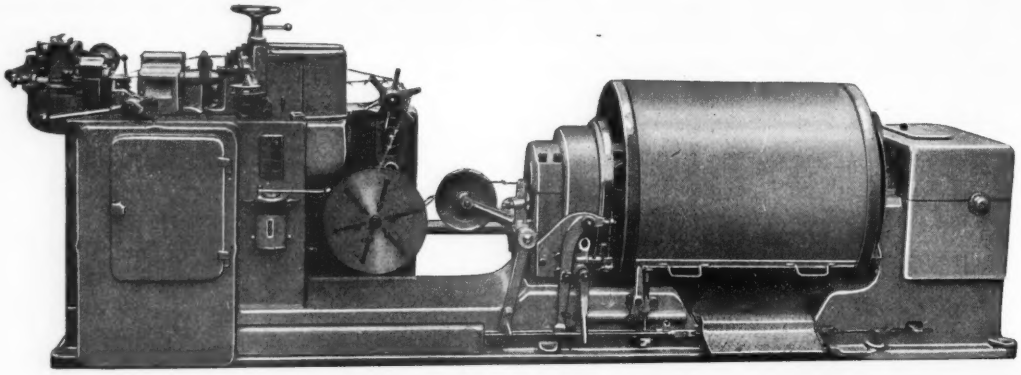
Dept. 12, 39 River Street, Buffalo 2, N. Y.

Designers and Builders of High Temperature Electric Furnaces

J.G.KAYSER
MASCHINENFABRIK NÜRNBERG

Leading in the field of

Barbed Wire Making Equipment for almost 50 years

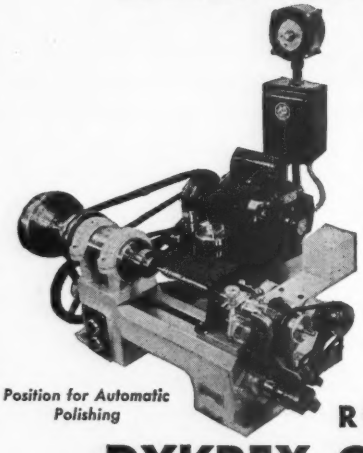


Latest type of High Speed Barbed Wire Machine
Mod. BSD N (Tifon)

NEW DYKREX POLISHERS CUTS DIE FINISHING TIME and LABOR COSTS 50%

NEW MODEL "M" DYKREX POLISHING and FINISHING MACHINE

It's Automatic with Split-Second Changeover!



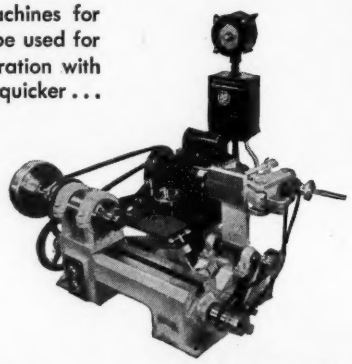
Position for Automatic Polishing

Here's the newest in LABOR-SAVING machines for re-finishing Tungsten Carbide dies. It can be used for manual, semi-automatic or automatic operation with timed switch. It finishes the die faster . . . quicker . . . and better.

It's complete . . . no changeovers . . . no lost parts . . . (no removal of parts . . . to "stall" for hand-finishing work.)

PROMPT DELIVERY

Replace your outmoded machine with our new LABOR-SAVING machine *NOW!*



Position for Hand Finishing

WIRE OR WRITE FOR DETAILS

ROOS TOOL & MFG. DIV.

DYKREX CORPORATION of AMERICA

33-35 BLOOMFIELD AVENUE **NEWARK 4, NEW JERSEY**

Solubility of Carbon

(*Continued from page* 266)

nealed at lower temperatures than the higher-carbon varieties. In the absence of definite knowledge of the carbon solubility, however, it has been necessary to keep annealing temperatures quite high in order to assure an austenitic structure. For these reasons the results of the NBS study have considerable practical as well as theoretical interest.

★ ★ ★

The specimens investigated at NBS were high-purity iron-nickel-chromium alloys containing various additions of carbon ranging from 0.007 to 0.30 percent. All alloys were melted and solidified in vacuum. Ingots thus formed (weighing about 2 pounds each) were hot-forged to about 0.6-inch diameter, annealed at 1975°F, and cleaned by grinding to about 0.5-inch diameter. Half of each rod was then cold drawn. All of the resulting specimens, both as an-

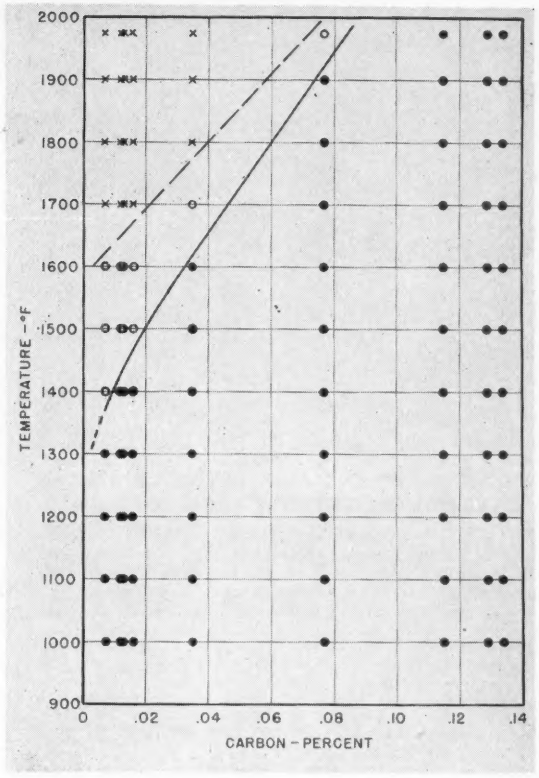
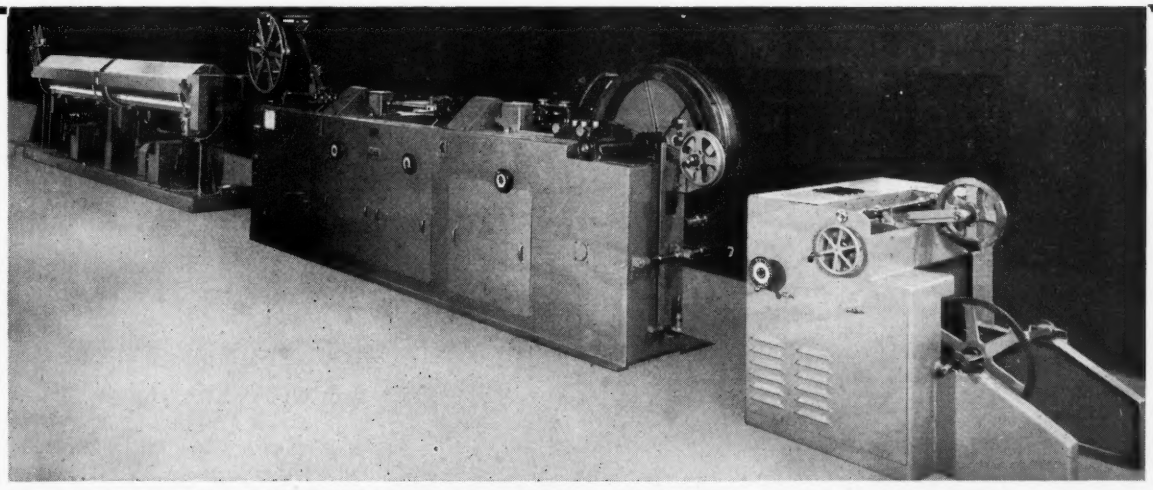


Figure 2. Results of the National Bureau of Standards study of solubility of carbon in high-purity austenitic alloys containing 18 percent of chromium, 10 percent of nickel, and balance iron. The solid line indicates the limit of substantial solubility; the dashed line indicates temperatures at which even the most minute traces of carbides are dissolved. (Solid circles, carbides; open circles, slight traces of carbides; crosses, no carbides.)



#4D-1-BB GLASS INSULATION WIRE COVERING MACHINE

WITH VARIABLE SPEED DRIVE.
TORQUE MOTOR DRIVEN TAKE-UP REEL STAND
BALL AND ROLLER BEARING MOUNTED
BAKING OVEN WITH DOUBLE VARNISH APPLICATOR
AND AUTOMATIC TEMPERATURE CONTROLS.

Wire Drawing, Enameling, Tinning, Insulating,
Taping, Glass-Covering, Panning and Allied Machinery

No. 1088 Patented Aug. 3, 1943

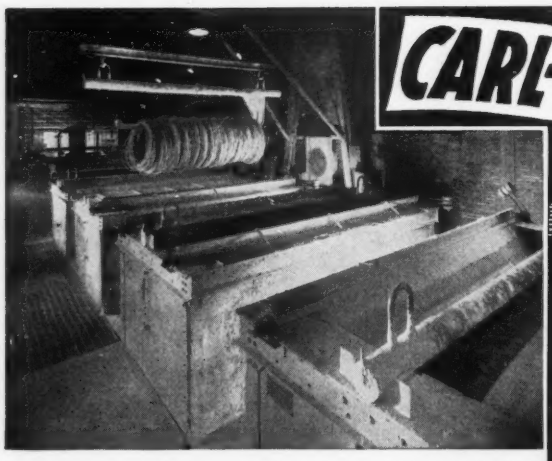
EST. 1855 AIMCO INC. 1915

"American" INSULATING MACHINERY COMPANY

REG. U.S. PAT. OFF.

FAIRHILL AND HUNTINGDON STREETS

PHILADELPHIA 33 PENNSYLVANIA U.S.A.



CARL-MAYER

HI-SPEED REGISTERED

ROD BAKERS

PATENT Nos.
U.S.A.
2,235,559
2,296,361
2,323,828
CANADA
396,144
401,589

ALSO OTHER TYPES OF INDUSTRIAL OVENS AND FURNACES

GREATER SPEED AND FUEL ECONOMY PROVES OUTSTANDING ENGINEERING

Carl-Mayer Hi-Speed Rod Bakers have an exclusive heating arrangement, combining faster baking with amazing fuel economy—and a patented Blow-Off feature which removes moisture without bumping or agitating the coils. *WRITE FOR BULLETIN NO. 350.*

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Atlantic Wire Co.
Atlas Steel Co.
Atlas Tack Corp.
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Canadian Steel Corporation.
California Wire Cloth Corp.
Colorado Fuel & Iron Corp.
Crucible Steel Co. of America
Eaton Manufacturing Co.
Frost Steel & Wire Co., Ltd.
B. Greening Wire Co., Ltd.
Gary Screw & Bolt Division of Pittsburgh Screw & Bolt Corp.
Hollup Corp.
Indiana Steel & Wire Co.
Johnson & Nephew, Ltd.
Jones & Laughlin Steel Corp.
Page Steel & Wire Co.
Pittsburgh Tool Steel Wire Co.
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THE CARL-MAYER CORPORATION

3030 EUCLID AVENUE
CLEVELAND, OHIO

COLDSET

GUARANTEED PURE

Diamond Powders

In All Mesh and Micron Sizes

- Cuts Your Finishing Costs
- Saves Time and Improves Finish Quality
- Meets U.S. Bureau of Standards Specifications
- Immediate Delivery Anywhere

Contact us today!

We Reclaim Diamond Powder From Old Wheels!

●

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COLDSET

AMERICAN COLDSET CORP. COURT ST. PATERSON, N. J.

nealed and as cold drawn, were next held at 800°F for 6 weeks to precipitate carbon in excess of the solubility at that temperature. Finally, samples were held at various higher temperatures to effect re-solution of the precipitated carbides up to the limit of solid solubility. (The excess carbon not in solid solution was present as chromium carbide [$Cr_{23}C_6$].)

★ ★ ★

Several methods for determining the limit of carbon solubility were tried, but only metallographic examination proved feasible. This was complicated, however, by the presence of ferrite and sigma in many of the samples. It was noted that sigma was a stable phase in the lower-carbon alloys, particularly in the temperature range of about 1000° to 1300°F.

★ ★ ★

The use of type 304 ELC steels in industry is based on the premise that the low carbon content (0.03 percent maximum) will give some protection against intergranular embrittlement. Such embrittlement results when austenitic stainless steels are subjected to temperatures in the range of about 800° to 1400°F and are either simultaneously or subsequently exposed to the action of certain corrodents. Intergranular embrittlement has been ascribed to the precipitation of chromium carbide at the grain boundaries of the austenite, and it has been proposed that the phenomenon might be completely inhibited by reducing the carbon content to less than the limit of solubility at temperatures to which the steel will be subjected. Although these extra-low-carbon steels have been shown to be less susceptible to intergranular embrittlement than the higher carbon varieties, the NBS study indicates that it is impracticable, if not impossible, to produce steels with carbon contents sufficiently low to insure freedom from carbide precipitation under all conditions of service.

New Power Cutter for Rods and Bars

A new and improved Di-Acro

Power Rod Parter for speedily and accurately cutting or "parting off" rods and bars (from 1/16" to 5/8") without burr and distortion is announced by **O'Neil-Irwin Mfg. Company,** 635 Eighth Avenue, Lake City, Minnesota.

★ ★ ★

Principal improvement in the Power Rod Parter is the replacement of an air operated power unit with a motor driven flywheel. The flywheel drive—operating at 180 strokes per minute—provides six times the cutting speed previously available. The new motor driven unit also offers greater convenience to the user since it can be installed in any plant where electric current is available.

★ ★ ★

An Ejectomatic Gauge, supplied as standard equipment with the Power Parter, allows the separate operation of gauging, ejecting and cutting to be performed in a single working cycle. Materials can be "parted off" as fast as the operator can feed stock through the cutting heads and engage the foot clutch. Rate of production varies with length of stock to be cut. Short lengths are gauged and cut more quickly than longer lengths.

★ ★ ★

Full information will be sent upon request.

New Cross Wire Welder Announced

A new wire mesh welder for making concrete reinforcing mesh, farm fence, etc., has been developed by **EVG Entwicklungs und Verwertungsgesellschaft,** Vinzenz-Muchitsch Strasse 36, Gratz, Austria.

★ ★ ★

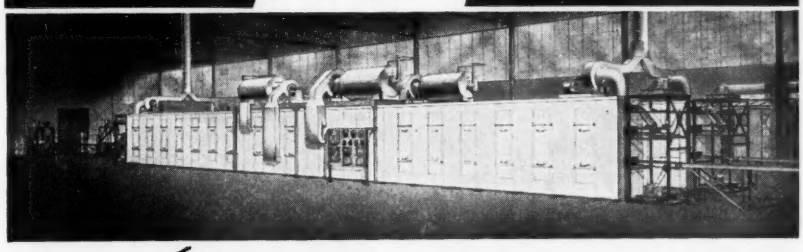
The equipment is said to embody an entirely new type of multi-spot welding and has had successful field tests in Europe. The output runs up to 3000 cross wires per hour and is fully automatic in operation, with adjustable distances of from 2" to 12" between wires. Only one man is required to operate a machine.

★ ★ ★

Full information will be furnished upon request.

CARL-MAYER WELDING ROD OVENS

PATENT NOS. 1,843,430 2,373,325



One of Several Carl-Mayer Ovens at Hollup Corp.

FAST, EFFICIENT AND ECONOMICAL DRYING OF COATED WELDING RODS.

Only in Carl-Mayer Ovens can you obtain the combination of the recirculating gas fired air heater principle and the "Mayer" patented rod transfer system — two highly important features in ovens of this type.

We also build other types of industrial ovens and furnaces. Carl-Mayer installations are backed by reputation for unusual performance, and over 30 years' experience.

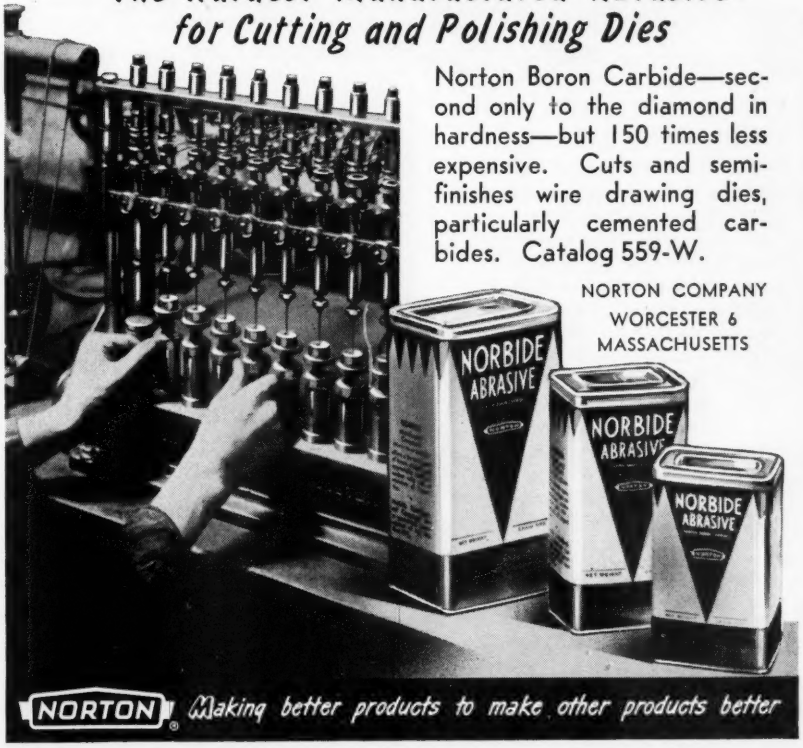
WRITE FOR BULLETIN NO. 350

THE CARL-MAYER CORPORATION

3030 EUCLID AVENUE
CLEVELAND, OHIO

NORBIDE® Abrasive

The Hardest Manufactured Abrasive for Cutting and Polishing Dies



Norton Boron Carbide—second only to the diamond in hardness—but 150 times less expensive. Cuts and semi-finishes wire drawing dies, particularly cemented carbides. Catalog 559-W.

NORTON COMPANY
WORCESTER 6
MASSACHUSETTS

NORTON® *Making better products to make other products better*

Investigate the complete line of world-famed Apco Mossberg Steel Reels, Spools and Bobbins today! Profit from a half-century of Apco experience and technical skill in providing copper wire, steel wire and wire rope manufacturers with the best in steel reels, spools and bobbins . . . in all sizes and shapes . . . for every application. Write today for complete details . . . get your free copy of the Apco Mossberg Steel Reel Booklet.

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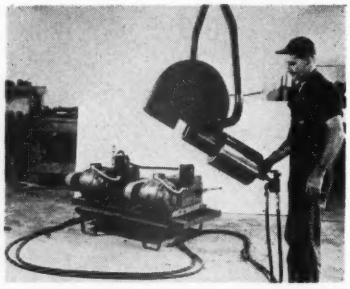
Toronto, Ont., Canada

APCO MOSSBERG CO.

(The original Frank Mossberg Co.)
ATTLEBORO, MASS.

New Mobile Guillotine Cutter Provides 150 Tons Thrust

The new Manco Mfg. Company's suspension-type Guillotine, Model 25-EE, combines tremendous thrust with relative mobility. The unit will cut up to 2¾" diameter steel rod in 13 seconds. It is also



adaptable for riveting cold rivets up to 1" and for punching and pressing, and is particularly advantageous where taking the tool to the job is desirable.

★ ★ ★

The easy-action hand lever control is manual, eliminating solenoids. The unit provides a 360° swivel and the cutting head weighs 470 lbs. Two Manco electric hydraulic pumps mounted in tandem provide the 150 tons thrust. For complete information write the manufacturer, Manco Mfg. Company, Bradley, Illinois.

Helical Spring Slide Rule Placed on Market

Messrs. Broadbent & Co. (Rochdale) Ltd., the well-known North of England Spring Specialists, have recently placed on the market a spring calculator, that will be found to be of inestimable value to all concerned with spring design and manufacture.

★ ★ ★

Whilst there have been previous attempts to put into Slide Rule form the accepted spring formulae, none have previously been successful in setting out the required calculations in such a useful way.

★ ★ ★

Given any two factors (known or assumed), all the other require-

M & T STANNOUS SULFATE

Saves Tin!

in liquor finishing operations

because

M & T Stannous Sulfate — a manufactured chemical— saves tin by doing away with many of the inefficiencies which accompany the treating of feather or flake tin to produce stannous sulfate on the job.

More convenient to use, too!

Baths are operable as soon as materials are dissolved. Solutions can be prepared in advance to produce desired colors and coating thicknesses.

AND, additions are made from stock solutions, assuring quick, complete mixing—eliminating any possibility of materials only partially dissolving in the bath—reducing the chances of miscalculating quantities of materials added.

Use M & T Stannous Sulfate for white or straw-color finishes. Write for technical procedure sheet.

METAL & THERMIT CORPORATION
Chemical Division
100 E. 42nd St., New York 17, N. Y.
Specialists in Tin and Tin Chemicals

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ZWEVEGEM
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Selling Office for
Tréfileries León Bekaert,
S.P.R.L.

STEEL WIRES

IF YOU REQUIRE

NO CMP REQUIRED

Submit your
SPECIFICATIONS
To The
REPRESENTATIVES:

J. GERBER & CO., INC.

855 Avenue of Americas
NEW YORK 1, N. Y.

ments can be observed immediately.

★ ★ ★

The calculator is a thoroughly workmanlike piece of equipment, being engine divided, and is supplied with full instructions for its use.

★ ★ ★

The firm is now working on a model for the American market by substituting the English decimal and Imperial wire gauge, by the more commonly used American wire gauge sizes.

★ ★ ★

The suppliers are prepared to consider granting sole selling rights. Please write the company at Grove Spring Works, Lincoln St., Rochdale, England.

★ ★ ★

Atlas Develops New Adhesive

The Atlas Mineral Products Company announces the availability of adhesive systems for bonding foamed styrene to metal or other surfaces. The adhesives are available as liquids or mortars which can be sealed by pressure contact to secure exceptionally high bond strengths. These products are distributed under the trade names, AMPHESIVE 801 and ALFANE. For information, write to the company at Mertztown, Pa.

Carboloy Adds Distributor In Dayton

Dayton Supply & Tool Company, Inc., has been appointed a distributor for the **Carboloy Department of General Electric Company.** This marks the first new distributor to be named in 1953, Carboloy's 25th Anniversary year.

★ ★ ★

The Dayton, Ohio, company will carry the Department's entire line of standard tools and blanks, masonry drills and diamond wheel dressers.

★ ★ ★

C. F. Woessner, vice president, will direct the sale of Carboloy products.

Nothing Mysterious . . .

There's nothing mysterious about the way Mason can make a top-quality, non-returnable spool and sell it for less! It's simply a matter of modern production facilities.

Mason has integrated its entire manufacturing processes to such an extent that real savings are made possible—and these savings are passed on to you!

Mason Spools are available in standard head and barrel sizes. Write for a quotation today!

MASON CAN COMPANY
1949 Dexter Rd., East Providence 14, R. I.
MASON CAN COMPANY OF OHIO
Greenville, Ohio

HAVING TROUBLE WITH LIGHT WEIGHT REELS FAILING IN HEAVY DUTY SERVICE?

MILTON MACHINE offers you

A SOLUTION TO YOUR PROBLEM that'll save on replacement and maintenance!

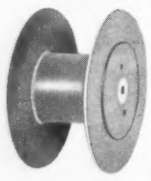
RUGGED STEEL HEAVY DUTY PROCESSING REELS

HEAVY DUTY REEL

Designed for the heavy duty service of a wire rope manufacturer. Flanges with rope brake rim grooves are heavily ribbed semi-steel castings.

WELDED STEEL REEL

Made to wire rope mill's specification to replace light weight pressed steel reels that failed in heavy duty service.



SOLID STEEL PROCESSING SPOOLS & BOBBINS

WRITE FOR BULLETIN 52-W

Your inquiries are invited . . . write or phone, our field engineer-representative will be glad to describe our facilities.

MILTON MACHINE WORKS, Inc.
DESIGNERS – ENGINEERS – MANUFACTURERS
MILTON • PENNA.

Announces Appointment of New Distributor

Reynolds Metals Company, through its General Sales Office in Louisville, Kentucky, announces the appointment of Aluminum Distributors, Inc., 618 West Pershing Road, Chicago 9, Illinois, as a distributor of Reynolds Aluminum Mill Products.

★ ★ ★

The distributor is completely equipped to furnish less than carload service on sheet, plate, wire, rod, bar, extruded shapes, tubing, pipe and structural products.

★ ★ ★

This new appointment of **Aluminum Distributors, Inc.,** will increase the availability of aluminum and offer better service to consumers in the Chicago area.

G.E. Opens New Silicone Facilities

Expanded facilities for the manufacture of silicone materials to meet increasing industrial demands were put in operation at the **General Electric Company's** vast silicone chemical plant in Waterford, N. Y., on January 15th. The Company said that the expansion, costing in excess of $5 million, gives its Chemical Division a silicone production capacity comparable to any in the country.

★ ★ ★

Coincident with the expansion of processing equipment, laboratory services have been doubled and employment is up 50 per cent from a year ago.

★ ★ ★

In announcing the opening of the new facilities, **Dr. Charles E. Reed,** general manager of the G-E silicone products department, said that the additional capacity will help relieve current shortages of many silicone materials for defense and consumer industries. This expansion and even larger facilities now being planned will ready General Electric for an expected tenfold increase in total industry demand for all silicone products by 1960.

BUNCHING (TWISTING) AND STRANDING IN THE WIRE AND GENERAL MANUFACTURING PROCESSES

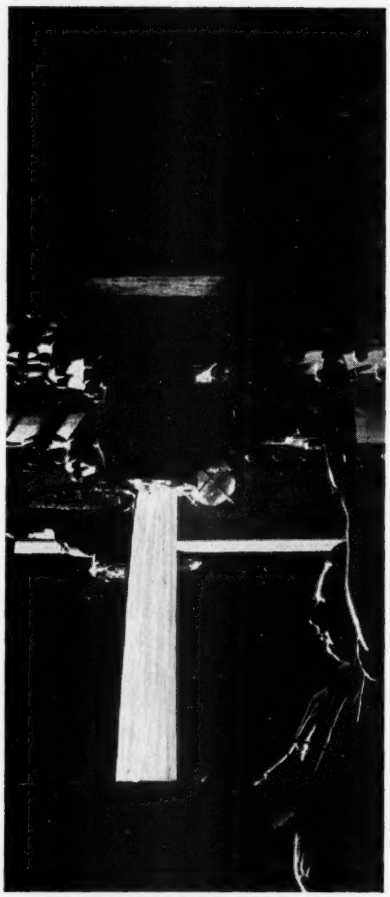
SPECIALIZED ENGINEERING AND SPECIALIZED FACILITIES AT YOUR SERVICE

Expanding application of twisting principles to the production of many products is reflected by an ever-increasing demand for both H-D standard equipment as well as machines especially engineered to solve varied production problems. Week after week surprising new uses are developed through the close cooperation of our engineering department with manufacturers in many fields.

Write today for our New Technical Bulletins. Tell us what you make—or contemplate making and your inquiry will receive prompt attention.

HASKELL-DAWES MACHINE CO., INC.

2231 E. ONTARIO ST.
PHILADELPHIA 34
PA.



2,000 GALLONS OF PROTECTION FOR YOU

The usual name for the liquid streaming into drums from our 2,000 gallon mixer is "lacquer." A more descriptive term would be "protection."

New England lacquer acts as protection for both the wire you make and the reputation you have as a manufacturer. As a tough, durable coating for your wire it helps insure satisfactory performance of your product to meet customers' specifications.

To be sure of maximum protection, specify *New England* lacquer, formulated to your exact needs by wire specialists!

The above photograph is one of many contained in an eight-page brochure describing our facilities to serve you. Write for your copy of the complete brochure!

Wire Mill Investment Differentials

by W. F. Schaphorst, M.E.
45 Academy Street
Newark, N. J.

Buying a thing that is "needed" is NOT an investment. It is a necessity. Buying food for the purpose of keeping alive is a necessity. Buying a pair of shoes is usually a necessity.

★ ★ ★

Let us say that you have decided that you need some wire making equipment. You write for prices and learn that the lowest price is $1000 and the highest price is $1150.

★ ★ ★

The important question is: Would you really save $150 by using the equipment of lowest cost even though it does meet your immediate requirements?

★ ★ ★

The answer is "No" in most cases, especially if the equipment of highest price is of the highest quality obtainable.

★ ★ ★

Instead of being a saving, failure to invest the $150 might easily result in a loss many times greater than $150 by the time the highest quality equipment would be discarded.

★ ★ ★

The $1000 spent would **not** be a true investment because you know you **must** have the equipment. But the $150 **would** be an investment because that expenditure is not absolutely necessary. You are the sole judge as to whether you are going to buy the $1000 or the $1150 equipment.

★ ★ ★

For example when you need a new suit of clothes and find the lowest price to be $30 you know you must spend at least $30. That $30 therefore would **not** be an investment. Instead of buying a $30 suit you actually do buy a $50 suit. You then **invest** $20 in the new suit and for that $20 you get better material, better workmanship, better appearance, longer wear, and great mental satisfaction. In other words you pay $20 for higher quality. The same is

Here's a Good Tip For Better Lubricating Film . . . Use

BORAX

• More and more, smart wire mills are switching to a BORAX solution for coating wire-stock surfaces before drawing. They choose BORAX because the residual film it produces stays tight, yet pliable, and is an excellent vehicle for the drawing lubricant. A BORAX solution coats steel wire with just ONE DIP . . . film dries quickly in just a few minutes.

Here Are The Advantages of Borax-Coated Stock:

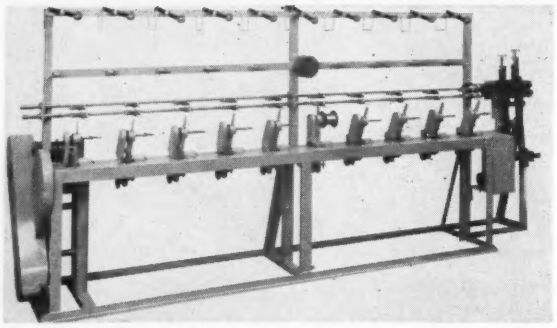
- **Compatible with drawing lubricant.**
- **Cleaner to handle in transit.**
- **Remains in better condition . . .** *an adequate supply can be stored for weeks without reconditioning.*
- **No cleaning of ends necessary before electric butt welding.**
- **Rust inhibited . . . no oxide film forms.**
- **Can be cleaned most easily.**

WRITE FOR FULL INFORMATION

PACIFIC COAST BORAX CO.
DIVISION OF BORAX CONSOLIDATED, LIMITED
NEW YORK • CHICAGO
LOS ANGELES • CLEVELAND
PHILADELPHIA

MANUFACTURERS OF FAMOUS 20 MULE TEAM PACKAGE PRODUCTS

PRECISION RE-SPOOLER



10 HEAD
TAKE-UP
and
PAY-OFF

WIRE
TENSION
CONTROL

PAY-OFF AND TAKE-UP IN ONE UNIT.

Now Used on Wire Down to B&S No. 42.

EACH HEAD INDIVIDUALLY DRIVEN FOR SMOOTH START.
WINDS TWO DIFFERENT TRAVERSE SPOOLS AT SAME TIME.

OTHER COOK EQUIPMENT

- Wire Drawing machines
- Bunchers
- Twisters
- Special machinery
- Wire String-Up machines
- Enameling Take-Ups and Pay-Offs
- Enameling machines
- Cabling machines
- Spoolers
- Tinning Take-Ups and Pay-Offs
- Tinning Pots
- Wrapping machines

COOK MANUFACTURING COMPANY

265 NORTH 9TH STREET **PATERSON 2, N. J.**

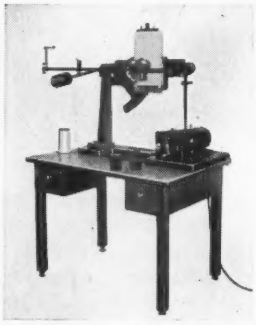
TESTED IS TRUSTED

FOR TESTING

ELECTRONIC WIRES

Scott Incline-Plane* Testers, IP-2 and IP-4, are the accepted standard for evaluating electronic wires for tensile and elongation. Capacities span the requirements from the very finest wires up, with high sensitivity to the reaction of the specimen. Results are in the form of "picturized" charts which can be read literally and are invaluable for filing and reference.

Literature upon request



IP-2 INCLINE-PLANE TESTER

* Registered Trademark

SCOTT TESTERS, INC.

55 Blackstone St.
Providence, R. I.

Scott Testers — Standard of the World

true of wire plant equipment.

★ ★ ★

Therefore the commonly called "differential," which is the difference between the best and the poorest, is the only true investment that is made, and it has been demonstrated time and again that such differential investments are generally well worth while. Equipment of highest quality is always superior in every respect to equipment that merely "gets by" within the range of immediate requirements.

★ ★ ★

Buyers who are real investors are seldom afraid to pay a higher price for wire machinery that is BETTER.

Technical Bulletin on Electrolytic Grinding Issued by Norton

The Norton Company, Worcester 6, Mass., has issued an eleven page technical bulletin, #526, on "Electrolytically-Assisted Diamond Wheel Grinding of Cemented Carbide."

★ ★ ★

Through this process, said to conserve diamond bort, stock removal is assisted by a simultaneous electrolysis of the carbide.

★ ★ ★

The equipment and its operation is described in detail with full data furnished on the rate of cutting the stock. Application to sharpening carbide tools is used as an example. Since the process uses only a fraction of the diamonds consumed in conventional cutting, a distinct saving is indicated.

★ ★ ★

Copies of Bulletin 526 will be sent upon request.

New Bulletin on Testing Machines

Testing Machines Baldwin bulletin 4204 (4 pages) describes and illustrates new improved models of Baldwin 60-H and 12-H low-cost universal testing machines. Copies may be obtained from **Baldwin-Lima-Hamilton Corporation,** Philadelphia 42, Pa.

Advantages of Helical Gear Drives Described in New Link-Belt Book

Helical gear drives — their advantages, fields of application and correct selection—are discussed in a new, illustrated 16-page Book No. 2451, just released by **Link-Belt Company.**

* * *

Full-page cross-sectional views show in detail the design and construction features of both the double and triple reduction types. Installation photographs picture typical installations.

* * *

All factors governing correct selection are described in detail. The right drive for any application can be chosen readily, because horsepower ratings for all drives, in all ratios, for various input speeds, are shown in tabular form.

* * *

Load classes for 170 types of machines, arranged alphabetically from agitators to windlasses, are tabulated. Other tables give the maximum overhung loads for drives of various sizes. Principal dimensions of the various drives are shown.

* * *

Link-Belt helical gear drives are made in a range of sizes for capacities from fractional to over 100 horsepower and ratios up to approximately 300 to 1.

* * *

Book No. 2451 will be sent to any interested reader on request.

Booklet on Plant Layout Offered

The third in a series of valuable booklets designed for administrating and operating executives of industry, "Plant Layout" is now available from the consulting engineering firm of **Wheeler Associates.**

* * *

This booklet covers such important phases as The Work Area, How To Develop A Better Layout, Layout Planning, Work Area Planning, Basic Principles of Good Layout, Balanced Motions, A Fixed

High Quality

COPPER and BRONZE WIRE

High Carbon and Low Carbon

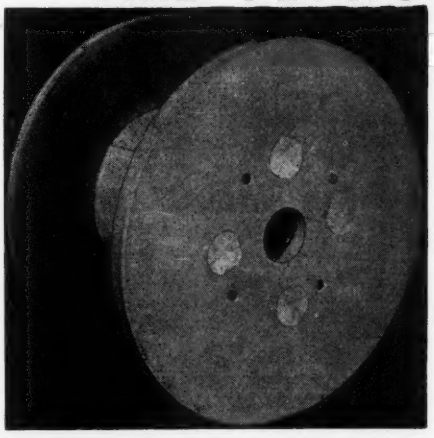
Specialty Steel Wire

Spencer wire corporation

555 LEHIGH AVENUE, UNION, N. J.

Plants at Union, N.J., Hillside, N.J., West Brookfield, Mass.

FINE PLYWOOD REELS FOR WIRE



Made of *air* dried wood, all parts secured with dowel pins, making the reel *all wood* in construction. These are the famous dowel constructed reels originated by WINCHESTER.

Accurately fitted dovetail joints result in reels that are extremely rigid and strong. No joints to open up.

Made in diameters of 6" to 48", returnable and non-returnable.

Shipped to any point in New England by truck.

Get the facts today on these fine reels

WINCHESTER REEL COMPANY, Inc.

ASHUELOT, N. H. TEL.: WINCHESTER 163-2

Our Products Carry Reel Loads.

VINYLS for...

CRITICAL CUSTOMERS

For the past ten years we have specialized in the compounding of Vinyl extrusion and injection molding compounds to specifications, or developing compounds for a specific use.

Underwriters' approved standard compounds are available in all colors for POT, T, TW, 80 Degree C, 90 Degree C and 105 Degree C wires.

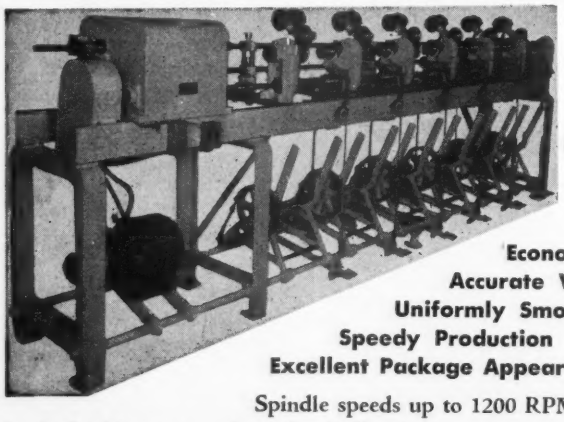
Save your plant space for wire processing equipment. Let us tailor your compounds to bring out the special properties you require.

Your inquiries are invited.

ELECTRONIC RUBBER COMPANY

69 Sunnyside Ave. • Stamford, Conn.

DEPENDABLE • ACCURATE WINDING



BOYD MULTI-HEAD SPOOLER

Improved Design
Precision
Engineered

Economy Operation
Accurate Winding
Uniformly Smooth
Speedy Production
Excellent Package Appearance

Spindle speeds up to 1200 RPM are possible. Can be had with any number of spindles from one to twelve. The six-head spooler shown above has a common traverse for all spindles. Each spindle is started independently by manual control — and stops automatically at predetermined footage. Traverse changes from ½ to 8" or more are easily made. Winds wire on spools up to 14" in dia. Anti-friction bearings throughout. Counter stop-motion, wire compensators and wire straighteners optional. Operator requires no training, skill or experience.

Send for full details.

BOYD & SONS MANUFACTURING CORPORATION

1434-38 Callowhill St. **Philadelphia 30, Pa.**

Place, Using Gravity and Drop Delivery, Using Holding Devices, Pre-Positioning of Tools and Materials, Making Parts in Multiples, and Using Ejectors and Clamps.

★ ★ ★

Two pages of the booklet are devoted to an Improvement Check Sheet which poses many questions designed to aid in evaluating a company's existing layout.

★ ★ ★

Copies of this or the preceding two booklets may be had by written request to Wheeler Associates Inc., 15017 Detroit Avenue, Cleveland 7, Ohio.

All Plastic Pole & Bracket Cable For Street Lighting

A new plastic-insulated pole-and-bracket cable manufactured by Anaconda Wire & Cable Co., New York, N. Y., now is available in addition to the conventional rubber-insulated construction for street-lighting service.

★ ★ ★

Voltage rating of the new cable is 600 volts between conductors; 6000 volts from conductor to ground. Other voltage ratings can be supplied on request.

★ ★ ★

Construction consists of two flexible stranded conductors, each insulated with PVC, one black and one white, laid parallel, these covered with a black polyethylene jacket. The cable is finished oval-shaped and comes in three standard sizes.

Howe Folder Describes Motor Truck Scales

An eight-page two-color folder (Form No. 678) just released, illustrates and describes the complete line of modern, heavy-duty Howe Four-Section Straight Lever Ball-Bearing Motor Truck Scales for weighing big truck and trailer loads.

★ ★ ★

The folder reviews and illustrates many exclusive Howe features including the renowned ball-protected bearings, "Inside" anti-friction plates and other construc-

tion details. Installation photographs are shown.

★ ★ ★

Complete specifications and pit dimensions are listed. The Howe Four-Section Straight Lever Motor Truck Scale has a capacity of 50 tons. Platform sizes are 45, 50, or 60 feet long by 10 feet wide.

★ ★ ★

The folder also describes the most complete line of weight indication offered with these scales including: the Full Capacity Beam, Type Recording Beam, Balance Indicator, the exclusive Model 77-D and Cabinet Weightographs, the unique Tape-Drive Cabinet Dials, and the revolutionary Howe Teleprint Electronic Remote Weight Recorder.

★ ★ ★

For further information, write for a free copy of Form No. 678, **The Howe Scale Company,** Rutland, Vermont.

Continuous Roller Hearth Furnaces

A new, illustrated bulletin on roller hearth furnaces has just been released by **Surface Combustion Corporation,** Toledo, Ohio.

★ ★ ★

Featuring the three principal design types—controlled atmosphere, direct-fired, convection heated—bulletin SC-160 describes typical process applications in both the ferrous and non-ferrous fields. Related prepared gas atmosphere generators are shown and a handy chart of prepared atmosphere compositions and applications is included for reference.

★ ★ ★

Copies of bulletin SC-160 can be obtained direct from Advertising Department, Surface Combustion Corporation, Toledo 1, Ohio.

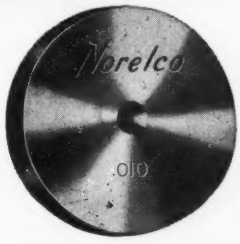
United Steel & Wire Opens New Plant

United Steel and Wire Company is in operation in a new plant in Wilkes-Barre, Pa.

★ ★ ★

The company, both here and in its two other plants at Battle

The TOP DIAMOND DIES are made by PHILIPS



For your most exacting wire drawing requirements, standardize on NORELCO Diamond Dies, made by the master craftsmen of PHILIPS in the world's largest, most modern diamond die factory.

Only the very best South African and Brazilian diamonds are used. Each consists of one closed crystal. Less than .4% of all the diamonds mined meet PHILIPS high quality requirements for purity, structure and shape.

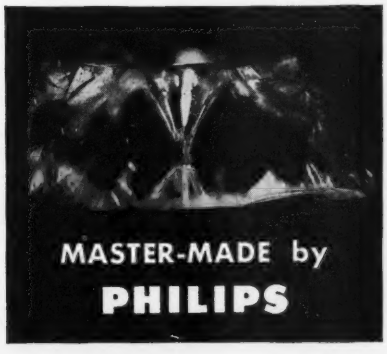
These diamonds are drilled to precision tolerances, varying in proportion to the diameter, normally 0.3 to 3.5 microns. Closer tolerances can be supplied, if required.

Let us quote on your diamond die requirements.

North American Philips Company, Inc.
100 East 42nd Street, New York 17, N. Y.

Norelco

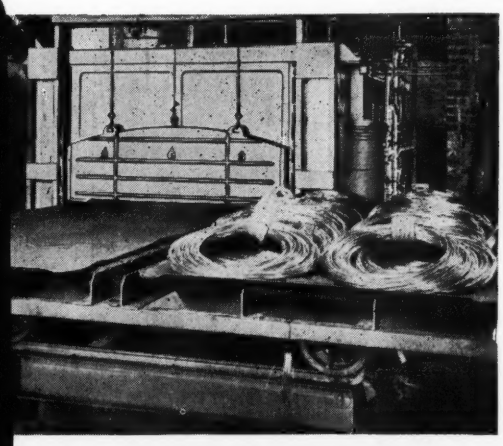
Note below the highly polished precision shaped drawing channel of this die for drawing copper which gives a burnished finish to the wire and long life to the die.



ROCKWELL FURNACES
for Annealing Hardening · Drawing · Normalizing Galvanizing and Tinning

Batch or Continuous · Oil, Gas or Electric

Direct Heated Muffle Type Radiant Tube Atmospheres



Gas-fired pan type furnace for annealing 5000 lbs. of medium gauge brass wire; furnace atmosphere controlled to produce oxide-free wire — in many cases practically bright. Other Rockwell furnace types include parallel tube, belt conveyor, pit, hood and others.

ROCKWELL BUILT SINCE 1888

FURNACES · OVENS · SPECIAL MACHINERY

W. S. ROCKWELL COMPANY

242 ELIOT STREET · FAIRFIELD, CONN.

In Canada: Francis Hankin & Co., Ltd. Montreal & Toronto

REELS **SPOOLS**

ALL SIZES

WOOD - PLYWOOD - WOOD - METAL

RETURNABLE NON-RETURNABLE

Samples and Prices on Request

DURKEE MFG. CO. **PINE RIVER, MINN.**

Buy the Best: **MONTGOMERY SILVER-COATED COPPER WIRE**

Round—Hard or Annealed on Spools. Plain or Stranded for HOOKUP and UHF CABLES.

Flat—For Tinsel Ribbons and Tinsel Garlands.

ALSO

Bare Electric Tinsel Conductors for Telephone-Razor-Hearing Aid Cords.

WRITE FOR DETAILS

Send for samples and engineering data.

THE MONTGOMERY COMPANY

25 Canal St., Windsor Locks, Conn. Tel.: 2-3338

Creek, Mich., manufactures a varied line of items from wire by an electric welding process.

★ ★ ★

Locally, according to Thomas Flood, plant superintendent, the company is producing oven racks and milk bottle cases as part of its main manufacturing line, in addition to aircraft maintenance platforms.

★ ★ ★

Mr. Flood stated that approximately 15,000 additional aircraft maintenance platforms will be manufactured for the Air Force on the current contract.

★ ★ ★

Present operations represent one-third capacity of the plant, Mr. Flood said. High on the list of the company's labor needs right now, he said, are arc welders for work on light tubing.

Instrument Announced for Checking Wire Drawing Dies

The new AO-ELDER DIE-ANGLE SCOPE, an optical instrument especially designed for measuring entrance angles of wire drawing dies, has been announced by **American Optical Company,** Instrument Division, Buffalo 15, New York.

★ ★ ★

This instrument has been developed and manufactured under license with **Flint C. Elder,** formerly Director of Research at American Steel and Wire Company.

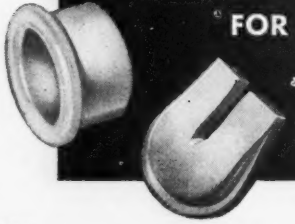
★ ★ ★

It permits even unskilled operators, with only a few minutes instruction, to read entrance angles to an accuracy of + or — 10 minutes of arc. The die is not damaged in any way. Multiple angles and poor polish are obvious immediately. Every size of carbide wire drawing die can be measured accurately—from the largest down to dies as small as .005".

★ ★ ★

The new DIE-ANGLE SCOPE is the first practical shop instrument for checking die angles **before** they can affect wire qual-

HEANIUM® WIRE GUIDES



FOR BETTER *PROVEN* PERFORMANCE AND LONG LIFE

Send for Detailed Information

HEANY INDUSTRIAL CERAMIC CORP.

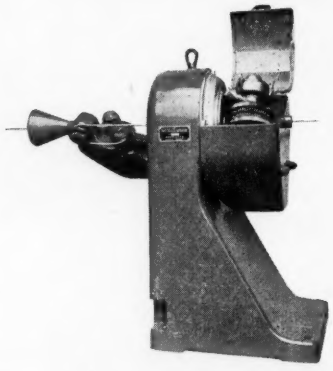
NEW HAVEN 3, CONN.

LINÉ-GORCY

MECHANICAL

WIRE ROD DESCALERS

(Patented in U.S.A.)



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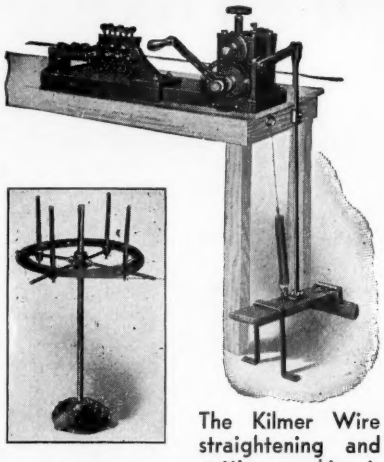
122 East 42nd Street

New York 17, N. Y.

Telephone: MUrray Hill 5-1937

WIRE STRAIGHTENER



The Kilmer Wire straightening and cutting machine is hand operated and recommended for wire No. 8 to No. 19 gauge.
Wire Reel will handle coils up to 150 lbs. with I.D. adjustments from 7" to 22" and 30" O.D.

M. D. KILMER & COMPANY
4840 BROOKPARK RD.
CLEVELAND 9, OHIO

There is no economic substitute for...
INDUSTRIAL DIAMONDS
they ARE available for all industrial applications
75 MEMBER COMPANIES
Cooperating with Industry
INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, INC.
write for booklet
"THE DIAMOND THAT PAYS FOR ITSELF"
INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, Inc.
124 E. 40th St., New York 16, N. Y.

ity. It permits more intelligent control of wire drawing processes, resulting in higher quality and reduced spoilage.

★ ★ ★

This new AO Scientific Instrument is compact, portable and simple to operate. It is sturdily constructed of light-weight aluminum castings, with integral light source and transformer.

AI & SI to Hold General Meeting in May

The American Iron and Steel Institute will hold its sixty-first general meeting at the Waldorf-Astoria on May 27th and 28th, 1953, in New York City.

★ ★ ★

The meeting is only open to members, the first day being devoted to technical sessions and the second to general Institute matters, following the usual line of previous years. A banquet on the 28th will conclude the meeting. Members will receive details of the program in due course.

"Wire Reference Year Book and Directory"

The second issue of the above-titled British directory has been issued by **Alfred Hinde, Ltd.,** Clarence Street, Wolverhampton, England.

★ ★ ★

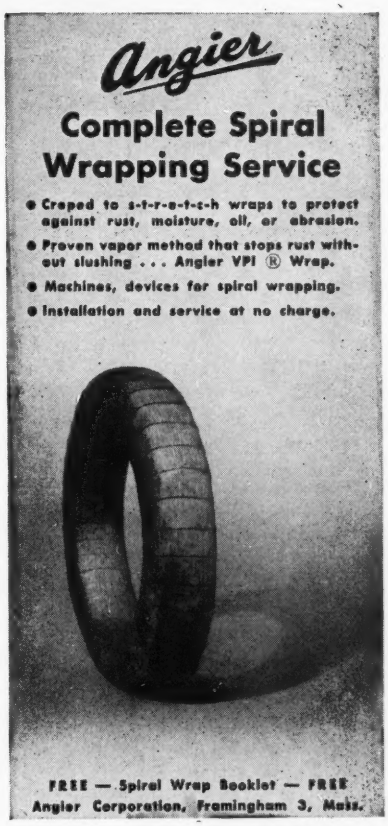
It has been revised to be more compact, to provide greater readability and has been geographically coded to enable buyers to pinpoint their nearest suppliers readily.

★ ★ ★

The directory covers manufacturers of rod, wire and wire goods, wire machinery and processes. It contains a bibliography on wire and a supplement containing a substantial American bibliography.

★ ★ ★

Other contents are a table of brand names, British wire standards, and miscellaneous useful tables. About 50% more listings are published than contained in the first edition. The price is 25/-; orders may be sent direct to the publisher.


Angier
Complete Spiral Wrapping Service
• Craped to s-t-r-e-t-c-h wraps to protect against rust, moisture, oil, or abrasion.
• Proven vapor method that stops rust without slushing . . . Angier VPI ® Wrap.
• Machines, devices for spiral wrapping.
• Installation and service at no charge.
FREE — Spiral Wrap Booklet — FREE
Angier Corporation, Framingham 3, Mass.

YARNS

For electric wire. Acetate, nylon and silk, natural or dyed. Put up on braider tubes, spools or cops.

OSCAR HEINEMAN CORPORATION
Division of Aetna Industrial Corp.

DONALD G. BREWSTER
President and General Manager
2701 Armitage Avenue, Chicago 47, Illinois

Concord Branch
20 N. Kerr St., Concord, N. C.

Sales Agents
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FRANK LUNDAY
P. O. Box 1154, Charlotte, N. C.
Tel. Charlotte 8100

HKP
PORTER
HANDKLIP
6C WIRE
CUTTER

For FREE CUTTING of wires, cable, rods, baling wire and bolts up to medium hardness.

One of the handiest, most useful cutters ever made. Parrot-beak jaw quickly locates material for easy cutting. Protruding tip of jaw prevents wire from slipping, aids in stretching wire and is great for pulling out staples.

Essential equipment for cutting high tensile communication and power wires used in rural electrification (Model 6B with special hard cutting edges). See your supplier.

H. K. PORTER, INC.
Somerville 43, Mass.
Porter Cutters Porter Pruners
PORTER-FERGUSON Autobody and Fender Repair Tools

METAL BOUND
RETURNABLE REELS

Made in 12" to 24" diameters.

No nails used. *All glued construction.* Made of kiln-dried wood. Special design prevents breaking or splintering of wood, protecting insulated wire from damage.

Write for details

WILLIAM McCASKIE, INC.
FORGE ROAD • WESTPORT • MASS.
Tel.: 145 Est. 1903

Copper Coating Compound Growing in Favor With Mills

Since The Techema Company moved from Toronto to its new headquarters in Buffalo, the sales of its coppering compound, "Fluidox," are said to have been expanding steadily in American wire mills, due to its many excellent qualities.

★ ★ ★

Among these is the fact that with the use of Fluidox a good non-electrolytic coating of copper may be applied to steel wire at a cost of approximately $1.00 per ton of wire. The coating will be even, free from black spots and discoloration, of high density and good adhesion. Such coppered wire may be galvanized, twined or enameled directly over the copper coating.

★ ★ ★

Other advantages are its protection of the steel against oxidation, its providing a good base for lubricants that will facilitate drawing, and the reduction of wire breakage. It may be used with either wet or dry lubricants.

★ ★ ★

A folder describing Fluidox and giving instructions for its use will be mailed upon request to the company at 150 Mona Drive, Buffalo 15, N. Y.

Canada's Largest Phone Cable Being Laid

The largest telephone cable ever used in Canada is now being installed in Hamilton; it contains 4,800 separate wires.

★ ★ ★

The new cable connects the Bell Telephone Company's 4-5 exchange at the corner of London Street and Main Street East, with the wire and cable network serving Hamilton's east end. The cable stretches underground for 3,300 feet to Kenilworth Avenue.

★ ★ ★

Where the cable-sections meet, each wire in one section must be spliced together with the corresponding wire in the adjoining section.

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Dykrex Introduces Revolutionary Die Finishing Machine

The Dykrex Corporation of America, 33 Bloomfield Ave., Newark 4, N. J., has brought out a new die polishing and finishing machine that is said to be revolutionary in its performance. One of the major tungsten carbide wire drawing die manufacturers reports that its use in their plant has cut time and labor costs for this operation by as much as 50%.

★ ★ ★

The new machine is equipped with push-button controls that convert it instantaneously to manual, semi-automatic or full-automatic operation.

★ ★ ★

Die manufacturers and the die-rooms in wire mills will find in this machine a money-saving device that will pay for itself in a short time, besides enabling the operatives to turn out better dies.

★ ★ ★

Information on the machine may be secured by writing the corporation at the address above.

New Folder Guide for Stainless Steel Fabricators

The Alloy Metal Wire Company, Prospect Park, Pa., has published a folder providing complete information on Almet Stainless Steel Wire for both automatic inert gas welding and manual gas welding, as well as metalizing. Descriptions of wire and equipment for welding of stainless steels are provided. Information on wire sizing, temper, spooling, tolerances, and equipment is also included. Available without charge from the Alloy Metal Wire Company, Inc., Prospect Park, Pennsylvania.

Made Superintendent of Canadian Company

John C. Coppick, General Manager of **Graham Nail and Wire Products, Ltd.,** Toronto, Canada, has announced the appointment of **Robert Bailey** as Plant Superintendent, succeeding the late Lloyd McKechnie, who died in January. Mr. Bailey is a member of The Wire Association.

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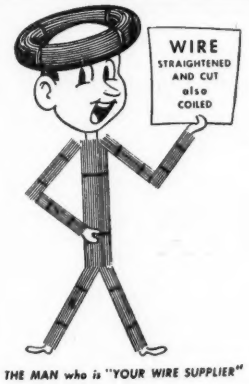

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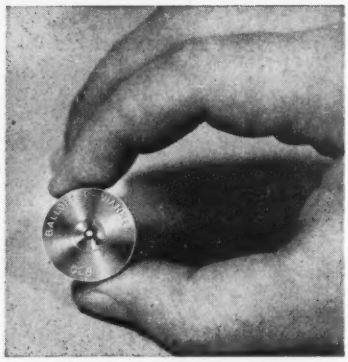

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Tension Considerations in Spooling Enameled Wire

(*Continued from page 262*)

will actually undergo. Speed control is very helpful in starting and stopping the equipment without breaking wires. The capstan should have the feature that it be non-overhauling. This means that the tension in the wire exerted by the spooler should not overhaul the capstan to the extent that it loses speed control and changes speed during the test. While speed is not a factor in tension consideration, it is helpful in spooler evaluation if the wire speed is kept constant during testing. It is well to use volt meters and ammeters on the capstan motor to check on the amount of power being required to run the test wire at the given speed.

★ ★ ★

From the capstan, the wire should run to some means for measuring tension. This tension can be measured by one of the many tension meters on the market. However, the author has not found a tension meter on the market with a capacity of greater than 20 lbs. tension. For higher tensions, it may be necessary to make a homemade tension indicating device such as is shown in Fig. 10.

★ ★ ★

The tension device in Fig. 10 is simply a balanced arm arrangement where the wire runs over three pulleys, the center pulley of which is connected by a linkage to a spring scale. Direct readings on the spring scale, divided by two, will give the tension in the wire.

★ ★ ★

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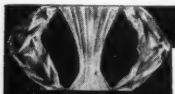

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After the wire tension has been measured, the wire is then run on to the spool using a spooler whose distributor rate is of the correct magnitude. It is recommended that several complete spools be run at several different tensions, so that the effect on the final spool package can be evaluated. The best evaluation test is to send the finished spools, each wound under a different tension, to the ultimate user to determine his reaction to the spooling condition.

★ ★ ★

Where the wire manufacturer does not have facilities for a test set-up, such as shown in Fig. 10, it is suggested that he contact the equipment manufacturer. These people generally have test facilities on hand for running such spooling tests. Such a step will enable the equipment manufacturer to get a better idea of the type of wire and the spooling conditions which his machine will be expected to handle.

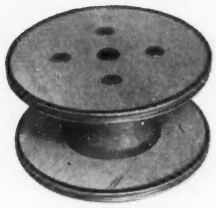
★ ★ ★

Test equipment and test time are often not available. Decisions on tension must then be made on the basis of past experience. Past experience, such as has been presented in this article, can be of great value when properly applied. This is particularly true if the experience of all parties concerned is effectively utilized.

★ ★ ★

If the occasion should arise where you are called upon to specify spooling tension, either for operational work or for new equipment, be sure that you don't take a chance by haphazard guessing, as to proper values. Take the time to carefully evaluate all the factors involved. When you have made your own decision, consult with the other people who have a stake in tension considerations. Obtain their agreement as to the values you have decided upon. The wire manufacturer, the equipment manufacturer, and the ultimate wire user all have a stake in deciding what the correct value is. Once an agreement is reached by all three parties, then and only then will you have arrived at the right decision.

★ ★ ★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Research and Engineering Progress in 1952

(*Continued from page 267*)

cellent electrical and physical properties, the compound is particularly resistant to water and humidity. Cables composed of this compound have good insulating properties after a 20-minute exposure to an open flame.

★ ★ ★

Temperature limits of silicone rubber were extended by the development of two new compounds. One, an extreme low-temperature silicone rubber that remains flexible at —110 F, is finding many uses in aircraft and military equipment. The other, a high-temperature silicone rubber that withstands 600 F for required periods of time, is being used to make flexible heater-ducts for jet engines.

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New Carboloy Catalog

The Carboloy Department of General Electric Company, Detroit 32, Michigan has issued its new Carboloy Die Catalog #D-130 and an accompanying Price List #D-132, containing latest specifications, general information and prices as of December 15, 1952.

★ ★ ★

The new catalog shows an expanded line of machinable header die nibs designed for greater economy.

★ ★ ★

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Index to Advertisers

A

Acrometal Products, Inc. 263
Ajax Electric Co., Inc., ... 246
Ajax Industrial Supplies, Inc. 316
American Chemical Paint Company ..... 278 and 282
American Coldset Corp. 302
American Insulating Machinery Company 302
American Woodworking Co. 317
Angier Corporation, The 313
Apco Mossberg Company 304

B

Baird Machine Co., The 252
Balloffet-Vianney Wire Die Co., Inc. 316
Bethlehem Steel Company 230
Bick, Hans C., Inc. 319
Boulin, Victor J., Inc. 316
Boyd & Sons Mfg. Corp. 311
Bridge Mfg. Co. 241

C

Canada Reel Co. 318
Carboloy Dept. of General Electric Co. ..... 272 and 273
Carl-Mayer Corp., The ..... 302 and 303
Carris Reels, Inc. 315
Chase Brass & Copper 237
Chemsteel Construction Co., Inc. 317
Clark, J. L. Mfg. Co. 291
Cleveland Tramrail Division of The Cleveland Crane & Engineering Co. 318
Cochaud Wire Die Corp. 316
Continental Steel Corporation 240
Cook Mfg. Co. 308

D

Danforth Co., C. W., The 317
Davis Electric Co. 238
Durant Mfg. Co. 317
Durkee Mfg. Co. 312
Dykrex Corporation of America—Roos Tool & Mfg. Div. 300

E

Eastern Carbide Corp. 316
Eisler Engineering Co., Inc. 317
Electric Furnace Company, The ..... Back Cover
Electronic Rubber Co. 310
Elgin National Watch Co., Abrasives Div. 251
Emory, Robert J. Company 317
Engis Equipment Co. Hyprez Div. 253
Entwistle, James L., Co. ..... 256 and 289
Erie Iron & Supply Corp. 315

F

Fatigue of Materials Laboratory 319
Fidelity Machine Co., Inc. 277
Firth Sterling, Inc. 229
Fisher Associates 312
Fort Wayne Wire Die, Inc. 316

G

Gerber, J. & Co., Inc. 305
Glader, Wm. Machine Works ..... 248 and 283
Glass Fibers, Inc. 242

H

Harper Electric Furnace Co. 299
Haskell-Dawes Machine Co., Inc. 306
Haveg Corporation 317
Heany Industrial Ceramic Corp. 312
Heineman Corp., Oscar 313
Herborn 250
Howsam Spool Company 317
Hughesville Machine & Tool Company 318

I

Imhoff, Wallace G., Co. 319
Indiana Wire Die Company 316
Industrial Diamond Association 313
Industrial Diamond Powders, Inc. 318
Industrial Ovens, Inc. 318
Interlocking Fence Co. 286

J

Johnson Steel & Wire Co., Inc. 276

K

Kayser Co. 300
Kelly Wire Die Corporation 316
Keystone Steel & Wire Company 280
Kilmer, M. D. & Co. 313

L

Lancaster, Allwine & Rommel 319
Lewis Machine Company, The 290

M

Malin & Company, The 315
Malmedie 297
Marshall-Richards Machine Co., Inc. ..... 231 and 247
Mason Can Company 305
McCaskie, Wm., Inc. 314
Metal Carbides Corporation 317
Metal and Thermit Corporation 304
Mettler Machine Tool, Inc. 236
Meyer, Roth & Pastor 296
Micro Products Company 275
Miller, R. H. Co., Inc. 249
Milton Machine Works, Inc. 306
Montgomery Co., The 312
Morgan Construction Company 232
Morrison Industries, Inc. 317
Mossberg Pressed Steel Corp. 284

N

National Machinery Exchange 318
National Research Co. 314
National Rubber Machinery Co. 291
Niehaus, K. A., Maschinenfabrik 286
Nelson Company, The 318
New England Butt Company 293
New England Lacquer Co. 307
New England Wire Die Co. 316
Niles Steel Products Div., Republic Steel Corp. 233
Nopco Chemical Co. 298
North American Philips, Inc. 311
North Anson Reel Co. 318
Norton Co. 303
Nukem Products Corp. 317

P

Pacific Coast Borax Company 307
Parkin Chemical Co., The 318
Pittsburgh Cut Wire Co. 314
Pittsburgh Steel Company 234
Platt Brothers & Co., The 318
Porter, H. K.. Inc. 314
Pourtier Freres, Ets. 294

R

Republic Steel Corp., Pressed Steel Div. 233
Rockwell, W. S., Company 312
Royle, John & Sons 285
Rusch Wire Die Corporation 316

S

Scott Testers, Inc. 308
Scudder, E. J. Foundry & Machine Co., Inc. 318
Siogren Tool and Machine Co., Inc. 287
Sleeper & Hartley, Inc. 317
Solar Compounds Corporation 279
Specialty Wire 318
Spencer Wire Corp. 309
Standard Industrial Compounds Co., Inc. 245
Standard Machinery Co. 243
Standard Mill Supply Co. 318
Steel Equipment Co. 318
Surface Combustion Corp. 318
Syncro Machine Company 244

T

Terkelsen Machine Co. 318
Torrington Mfg. Co. 281
Trauwood Engineering Co., The 318

V

Vascoloy-Ramet Corporation 254
Vaughn Machinery Company ..... Front Cover

W

Wafios Maschinenfabrik 294
Wartenweiler, Emilio 292
Waterbury Farrel Foundry & Machine Co. 239
Watson Machine Company ..... Inside Back Cover
Wayne Wire Die Co. 316
Wean Equipment Corporation ..... Inside Front Cover
Wilson, Lee Engineering Co., Inc. 318
Winchester Reel Co., Inc. 309
Wire Insulating Mach'y, Inc. 295
Wire & Textile Machinery, Inc. 315

Y

Youngstown Sheet & Tube Company, The 235

WHERE TO BUY

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.
Only advertisers who have contracted for six or more insertions are listed in this section.

ABRASIVES—
Ace Abrasive Laboratories, New York, N. Y.
Elgin National Watch Co., Abrasive Div., Elgin, Ill.
Norton Co., Worcester, Mass.

ACID INHIBITORS—
(See Inhibitors, Pickling)

ACID-PROOF CONSTRUCTION—
Ceilcote Company, Cleveland, Ohio
Chemical Construction Co., Pittsburgh, Pa.
Haveg Corporation, Newark, Del.

ANNEALING MACHINES — Electric Resistance
Syncro Machine Co., Perth Amboy, N. J.
Trauwood Engr. Co., Cleveland. O

ANNEALING POTS AND BOXES—
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

BAKERS—(See OVENS—Rod Bakers)

BOBBINS—Braider & Wire Weaving
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

BORAX—Wire Drawing
Pacific Coast Borax Co., New York, N. Y.

BORON CARBIDE—
Norton Co., Worcester, Mass.

BRAKES—Pneumatic
Entwistle, Jas. L. Co., Providence, R. I.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

CARTONS—Paper
(See CONTAINERS—Paper, for nails, etc.)

CASTINGS—Wire Mill
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

CEMENTS—Acid Proof
Ceilcote Company, Cleveland, Ohio

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
Metal & Thermit Corp., New York, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.
Standard Industrial Compounds Co., Chicago.

CLEANING & PICKLING EQUIP.—
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, O.
Haveg Corporation, Newark, Del.
Holden, A. F., Company, The, Detroit, Mich.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

CLOTH—WIRE, All Metals
Chase Brass & Copper Co., Waterbury, Conn.
Wickwire Bros., Cortland, N. Y.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Chicago.

COMPOUNDS—Coppering
American Chemical Paint Co., Ambler, Pa.
Miller, R. H. Co., Inc., Homer, N. Y.
Techema Co., Buffalo, N. Y.

COMPOUNDS—Diamond (Pre-Mixed)
Eastern Carbide Corp., New Rochelle, N. Y.
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago.

COMPOUNDS—Extrusion, for Wire
(See Compounds—Vinyl)

COMPOUNDS—For Improving Drawing and Extrusion
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Metal Finishing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Metal & Thermit Corp., New York, N. Y.

COMPOUNDS—Phosphate Coating
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago.

COMPOUNDS—Vinyl, for Wire
Electronic Rubber Co., Stamford, Conn.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Miller, R. H. Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Pacific Coast Borax Co., New York, N. Y.
Standard Industrial Compounds Co., Chicago.
Swift & Company, Chicago, Ill.

CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

CORROSION PREVENTIVE PAPERS—
Angier Corporation, The, Framingham, Mass.

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

CUTTING TOOLS—Wire
Manco Manufacturing Co., Bradley, Ill.
Porter, H. K. Inc., Somerville, Mass.

DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDERS—
American Coldset Corp., Paterson, N. J.
Danforth, The C. W. Co., Youngstown, Ohio
Elgin National Watch Co., Abrasive Div., Elgin. Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Industrial Diamond Powders, New Kensington, Pa.
National Research Company, St. Claire Shores, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDER RECLAIMING—
Boulin, Victor J., Inc., New York, N. Y.
Danforth, The C. W. Co., Youngstown, Ohio
Industrial Diamond Powders, Inc., New Kensington, Pa.
National Research Co., St. Claire Shores, Mich.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DIAMOND TOOLS—
Carboloy Dept. of General Electric Co., Detroit.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Wayne Wire Die Co., Hillside, N. J.

DIES—Carbide, Tungsten & Tantalum
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Cold Heading
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Vascoloy-Ramet Corp., No. Chicago, Ill.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Extrusion
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Eyelet
Eastern Carbide Corp., Now Rochelle, N. Y.
Kelly Wire Die Corp., New York, N. Y.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc, New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Cochaud Wire Die Corp., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Ft. Wayne Wire Die., Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS & TRAVERSES—Flange Steel
Entwistle, Jas. L. Co., Providence, R. I.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

DRYING EQUIPMENT
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S. Co., Fairfield, Conn.

ENGINEERS—Consulting
Metal Fatigue—Fatigue of Materials Laboratory, Princeton, N. J.
Wire Insulating and Rubber and Plastics Processing—Hale and Kullgren, Inc., Akron, Ohio
Zinc—Imhoff, Wallace G., Co., No. Highlands, Calif.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCING & FENCES—Wire
Interlocking Fence Co., Morton, Ill.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio
Harper Electric Furnace Corp., Buffalo, N. Y.
Rockwell, W. S. Co., Fairfield, Conn.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F. Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engineering Co., The, Cleveland. Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

FURNACES—Heat Treating
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Morrison Industries, Bedford, Ohio
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Pot (oil, gas, electric)
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, Detroit, Mich.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Resistance Heating, Strand
(See Annealing Machines)

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

GALVANIZING EQUIPMENT — (See MACHINERY—Galvanizing Wire)

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—for Wire
Heany Industrial Ceramic Corp., New Haven Conn.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOOKS—Pickling & Liming
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

IMPREGNATING MATERIALS—
Solar Compounds Corporation, Linden, N. J.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INSULATING MATERIALS—
Electronic Rubber Co., Stamford, Conn.
Glass Fibers, Inc., Toledo
Heineman Corp., Oscar, Chicago, Ill.
Merrimac Paper Co., New York, N. Y.
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

INSULATING MATERIALS — Paper—For Electric Wire Cable
Merrimac Paper Co., New York, N. Y.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

LACQUERING SYSTEMS — See MACH.—Lacquering Electric Wire

LACQUERS—For Electric Wire
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., Philadelphia and Bellefonte, Pa.

LUBRICANTS — For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

LUMBER—Wire Mill, Carload shipments for lagging and car blocking
Canada Reels, Ltd., Bury, Que., Canada
North Anson Reel Co., No. Anson, Me.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Machine Works, Chicago, Ill.
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Bolts & Rivets
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany

MACHINERY—Braiding
Fidelity Machine Co., Inc., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Solomon, Michael, New York, N. Y.
Wardwell Braiding Mach. Co., Central Falls, R.I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Inc., Philadelphia, Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Machinery—Winding Wire)

MACHINERY—Chain Making
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
Nilson, A. H. Machine Co., Bridgeport, Conn.

MACHINERY—Closing Rope
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Waterbury-Farrel Fdry. Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh.
American Insulating Mach'y Co., Phila., Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Mach'y Exch. (Used), New York.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Manco Manufacturing Co., Bradley, Ill.
Mettler Machine Tool, Inc., New Haven, Conn.
Porter, H. K., Inc., Somerville, Mass.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.

MACHINERY—Die Making
American Optical Co., Instrument Div., Buffalo, N. Y.
Victor J. Boulin, Inc., New York, N. Y.
Carboloy Dept. General Electric Co., Detroit, Mich.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelly Wire Die Corp., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wartenweiler, Emilo, Milano, Italy

MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, Ohio

MACHINERY—Extruding
Aetna-Standard Engineering Co., Pittsburgh.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
Royle, John, & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp. Cleveland, Ohio

MACHINERY—Forming Wire
Baird Machine Co., Stratford, Conn.
Nilson, A. H., Machine Co., Bridgeport, Conn.

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating Wire
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
Fidelity Machine Co., Inc., Philadelphia, Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Solomon, Michael, New York, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Mach. Co., Central Falls, R.I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Inc., Philadelphia, Pa.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia.
Industrial Ovens, Inc., Cleveland, O.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Interlocking Fence Co., Morton, Ill.

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Providence, R. I.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Baird Machine Co., The, Stratford, Conn.
Glader, Wm., Machine Works, Chicago, Ill.
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Optical, for Dies
American Optical Co., Instrument Div., Buffalo, N. Y.

MACHINERY—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

MACHINERY—Pin Making
Baird Machine Co., The, Stratford, Conn.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale and Kullgren, Inc., Akron, Ohio
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
Morgan Construction Co., Worcester, Mass.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Poulty Wire Fencing
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, O.

MACHINERY—Power Transmission
Reeves Pulley Company, Columbus, Indiana

MACHINERY—Pre-Heater for Wire (for Extrusion of Plastics)
Industrial Ovens, Inc., Cleveland, Ohio
National Rubber Machinery Co., Akron, Ohio

MACHINERY—Re-Spoolers
Boyd & Sons Manufacturing Corp., Philadelphia, Pa.
Davis Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Providence, R. I.
National Mach'y Exch. (Used), New York, N. Y.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Inc., Manchester, Conn.

MACHINERY—Rod Mill
Morgan Construction Co., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Rubber Insulating
National Rubber Machinery Co., Akron, Ohio
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spark Testing
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spring Making
Carlson Company, The, New York, N. Y.
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening & Cutting
Kilmer, M. D., & Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Medart Co., The, St. Louis, Mo.
Mettler Machine Tool Co., New Haven, Conn.
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Wartenweiler, Emilio, Milano, Italy
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Stranding
Haskell-Dawes Machine Co., Philadelphia, Pa.
Hughesville Machine & Tool Co., Hughesville, Pa.
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Hale & Kullgren, Inc., Akron, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Marshall-Richards Machine Co., Inc., Trenton, N. J.
Standard Machinery Co., Mystic, Conn.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Testing, Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phia., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Marshall-Richards Machine Company, Inc., Trenton, N. J.
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Tube Winders
Solomon, Michael, New York, N. Y.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y.
Solomon, Michael, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—for Wire Welding (See WELDERS—Butt and Spot)

MACHINERY—Winding Wire
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L., Co., Providence, R. I.
Federal Manufacturing Co., Wallingford, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply, Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Hale & Kullgren, Inc., Akron, Ohio
Marshall-Richards Machine Co., Inc., Trenton, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Wire Forming
Baird Machine Co., The, Stratford, Conn.
Kilmer, M. D., & Co., Cleveland, Ohio
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Angier Corporation, The, Framingham, Mass.
Marshall-Richards Machine C., Inc., Trenton, N. J.
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem, Rolling & Edging
Wean Equipment Co., Cleveland, Ohio

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Brothers, Inc., Cortland, N. Y.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Bedford, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

OVENS—Rod Bakers
Carl-Mayer Corp., The, Cleveland, Ohio
Morrison Industries, Bedford, Ohio

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Bedford, Ohio

PAINT—Acid Proof
Ceilcote Company, Cleveland, Ohio

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.
Solar Compounds Corp., Linden, N. J.

PAPER—Creped Wrapping
Angier Corporation, The Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS — (See COMPOUNDS — Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PICKLING—Hooks, etc. Acid Resisting
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

PICKLING TANK LININGS—
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.

PIPES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio

PRESSES—Hydraulic and Mechanical
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Standard Machinery Co., Mystic, Conn.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio

REEL AND TENSION STANDS—
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Fidelity Machine Company, Inc., Philadelphia.
Industrial Ovens, Inc., Cleveland, Ohio
Kilmer, M. D., & Co., Cleveland, Ohio
Roll-A-Reel, Cincinnati, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

REEL CRUTCHES—
Roll-A-Reel, Cincinnati, Ohio
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Milton Machine Works, Inc., Milton, Pa.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

REELS—Metal Bound
Canada Reels, Ltd., Bury, Que., Canada
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
McCaskie, Inc., Wm., Westport, Mass.
North Anson Reel Co., No. Anson, Me.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
McCaskie, Inc., Wm., Westport, Mass.
Nelson Company, The, Baltimore, Md.
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L. Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Canada Reels, Ltd., Bury, Que., Canada
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Mnn.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Howsam Spool Co., Aurora, Ill.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
McCaskie, Inc., Wm., Westport, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Wooden
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Canada Reels, Ltd., Bury, Que., Canada
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River Minn.
Nelson Company, The, Baltimore, Md.
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—(See Ovens—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Company, Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
American Steel & Wire Company, Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.

RUST PROOF COMPOUNDS—
(See Compounds—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See Compounds—Rust Preventing)

SALTS—Heat Treating, Descaling, etc.
Holden, A. F., Co., The, Detroit, Mich.

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See Compounds—Wire Drawing)

SODIUM—for Descaling
Holden, A. F., Co., The, Detroit, Mich.

SPOOLS—(See Reels & Spools)

SPOOLS—Stamped Metal for Retail Wire Sales
Clark, J. L. Mfg. Co., Rockford, Ill.
Mason Can Co., East Providence, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Youngstown Sheet & Tube Co., Youngstown, O.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Pickling and Plating
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.

TESTERS — INSULATION (See MACHINERY—Spark Testers)

TESTING EQUIPMENT (See MACHINERY Testing, Physical)

TINNING PROCESS—
Metal & Thermit Corp., New York, N. Y.

TINSEL—Electric Conductor
Montgomery Co., The Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper, Silver and False Gold Coated, etc. (See TINSEL—Electric Conductor)

TOOLS—Wire Cutting
Porter, H. K., Inc., Somerville, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Machy—Power Transmission)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Inc., Manchester, Ct.

TUBE BENDERS AND FORMERS—
Kilmer, M. D., & Co., Cleveland, Ohio

VALVES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VARNISHES—for Electric Wire
N. E. Lacquer Co., E. Providence, R. I.
Solar Varnish Corporation, Linden, N. J.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire Insulating Machy., Inc., Manchester, Ct.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

WIRE—Aluminum
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Malin & Co., Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, O.

WIRE—Barbed
Gerber, J., & Co., Inc., New York, N. Y.
Interlocking Fence Co., Morton, Ill.

WIRE—Brass
Chase Brass & Copper Co., Waterbury, Conn.
Spencer Wire Corp., Union, N. J.

WIRE—Brush
Gerber, J., & Co., Inc., New York, N. Y.
Spencer Wire Corp., Union, N. J.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Manufacturing Co., Fostoria, O.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
Chase Brass & Copper Co., Waterbury, Conn.
Gerber, J., & Co., Inc., New York, N. Y.
Spencer Wire Corp., Union, N. J.

WIRE—Flat, Fine
Anchor Wire Corp., Jamaica, L. I., N. Y.
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Gerber, J., & Co., Inc., New York, N. Y.
Montgomery Co., The, Windsor Locks, Conn.

WIRE—Forming
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.

WIRE—Galvanized
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Continental Steel Corp., Kokomo, Ind.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Newbury Co., The, Boston, Mass.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Manufacturing Co., Fostoria, O.
Spencer Wire Corp., Union, N. J.
U. S. Steel Co., N. Y., N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Music
American Steel & Wire Co., Cleveland, Ohio
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio
Newbury Co., The, Boston, Mass.
Seneca Wire & Manufacturing Co., Fostoria, O.
Specialty Wire Co., Inc., Worcester, Mass.
Spencer Wire Corp., Union, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Malin & Co., Cleveland, Ohio
Chase Brass & Copper Co., Waterbury, Conn.

WIRE—Oil Tempered
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester.
Keystone Steel & Wire Co., Peoria, Ill.
Newbury Co., The, Boston, Mass.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Specialty Wire Co., Inc., Worcester, Mass.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Specialty Wire Co., Inc., Worcester, Mass.

WIRE—Steel—Also Coppered and Galvanized Steel
Anchor Wire Corp., Jamaica, L. I., N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Spencer Wire Corp., Union, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

WIRE—Tungsten
North American Philips Co., Inc., Allied Products Division, New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WRAPPING PAPER—Creped (See PAPER—Creped Wrapping)

YARNS & TAPES—
Belding Hemingway, New York, N. Y.
Glass Fibers, Inc., Toledo, Ohio

YARN TESTERS—
Heineman Corp., Oscar, Chicago, Ill.
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

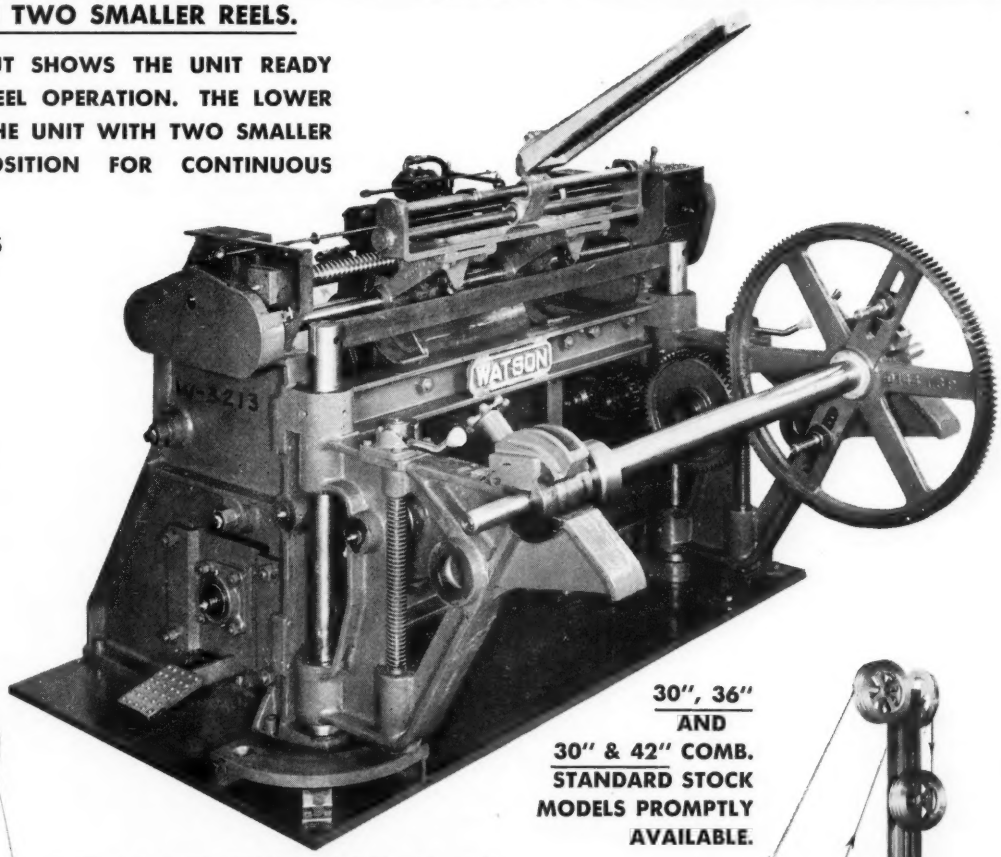
WATSON

TAKEUPS TYPE "DC"

THIS DOUBLE PURPOSE "COMBINATION" MODEL OPERATES WITH SINGLE LARGE REELS AND QUICKLY CONVERTS TO A CONTINUOUS TAKEUP OPERATING WITH TWO SMALLER REELS.

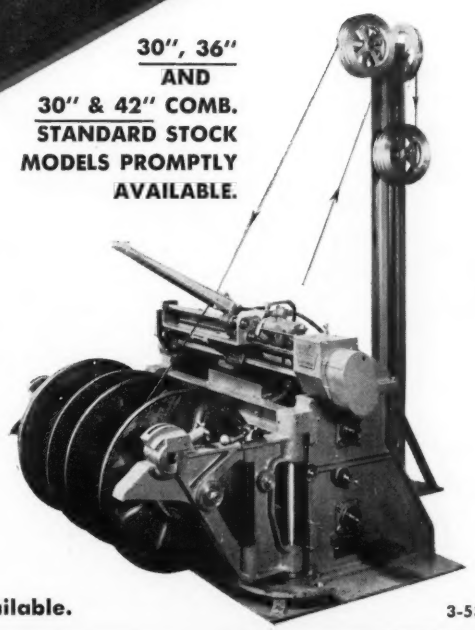
THE UPPER CUT SHOWS THE UNIT READY FOR SINGLE REEL OPERATION. THE LOWER CUTS SHOW THE UNIT WITH TWO SMALLER REELS IN POSITION FOR CONTINUOUS OPERATION.

IN BOTH CASES THE TAKEUP FUNCTIONS WITHOUT FRICTION-SLIP, AND THE WINDING TENSION REMAINS UNIFORM DURING THE REEL-RUN BUILD-UP.



ANY OF OUR "DC" TAKEUPS IN THE FIELD CAN EASILY BE CONVERTED TO "COMBINATION" MODELS BY SUPPLY OF ADDITIONAL PARTS, WITHOUT DISTURBING THE TAKEUP LOCATION.

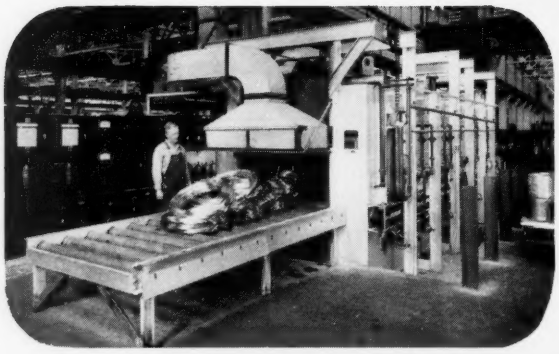
30", 36" AND 30" & 42" COMB. STANDARD STOCK MODELS PROMPTLY AVAILABLE.



Machine bulletin available.

3-53

These combination electric and gas fired radiant tube bulkhead tray type furnaces are used extensively for bright annealing wire on reels and in coils.



An EF gas fired three-chamber roller hearth with forced circulating system providing accurate temperature distribution, uniform finish and anneal—continuously.

EF builds Gas-Fired, Oil-Fired and Electric Furnaces for these and other heat treating operations

● EF engineers specialize in designing and building production furnaces — continuous and batch types — including roller hearth, roller rail, chain belt, wire belt, slot and tube conveyor types, reciprocating, rotary, car, bell, pit and other designs; complete with special atmosphere producers, and time and labor saving material handling equipment as required.

Reflecting more than 30 years of continuous research and experience, and outstanding engineering accomplishments, EF furnaces combine high heating efficiency, accurate automatically controlled cycles, and advanced designs that minimize maintenance, assure economy of operation, high hourly output and uniformity of product.

Submit your production furnace problems to ***experienced engineers — it pays.***

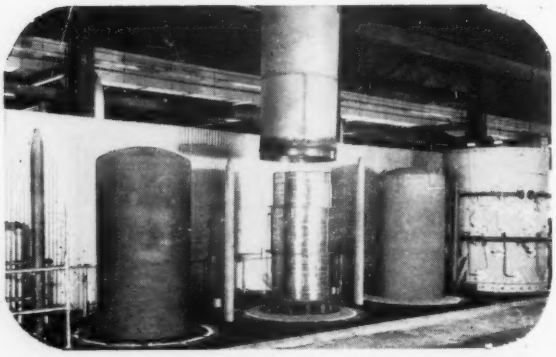
- AGING
- ANNEALING
- ALUMINIZING
- BRAZING
- CARBON RESTORATION
- CARBURIZING
- CERAMIC DECORATING
- DRAWING
- GALVANIZING
- HARDENING
- HOMOGENIZING
- MALLEABLIZING
- NORMALIZING
- NITRIDING
- SINTERING
- SOLUTION TREATING
- SPECIAL ATMOSPHERE TREATMENTS AND OTHER PROCESSES

THE ELECTRIC FURNACE CO.

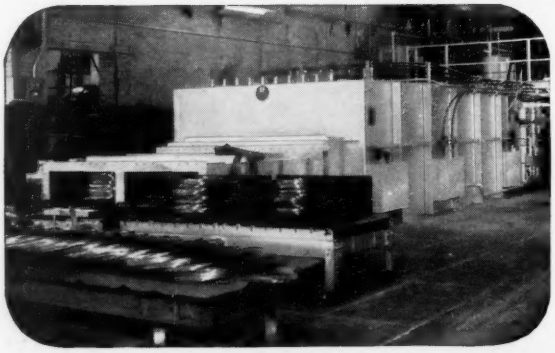
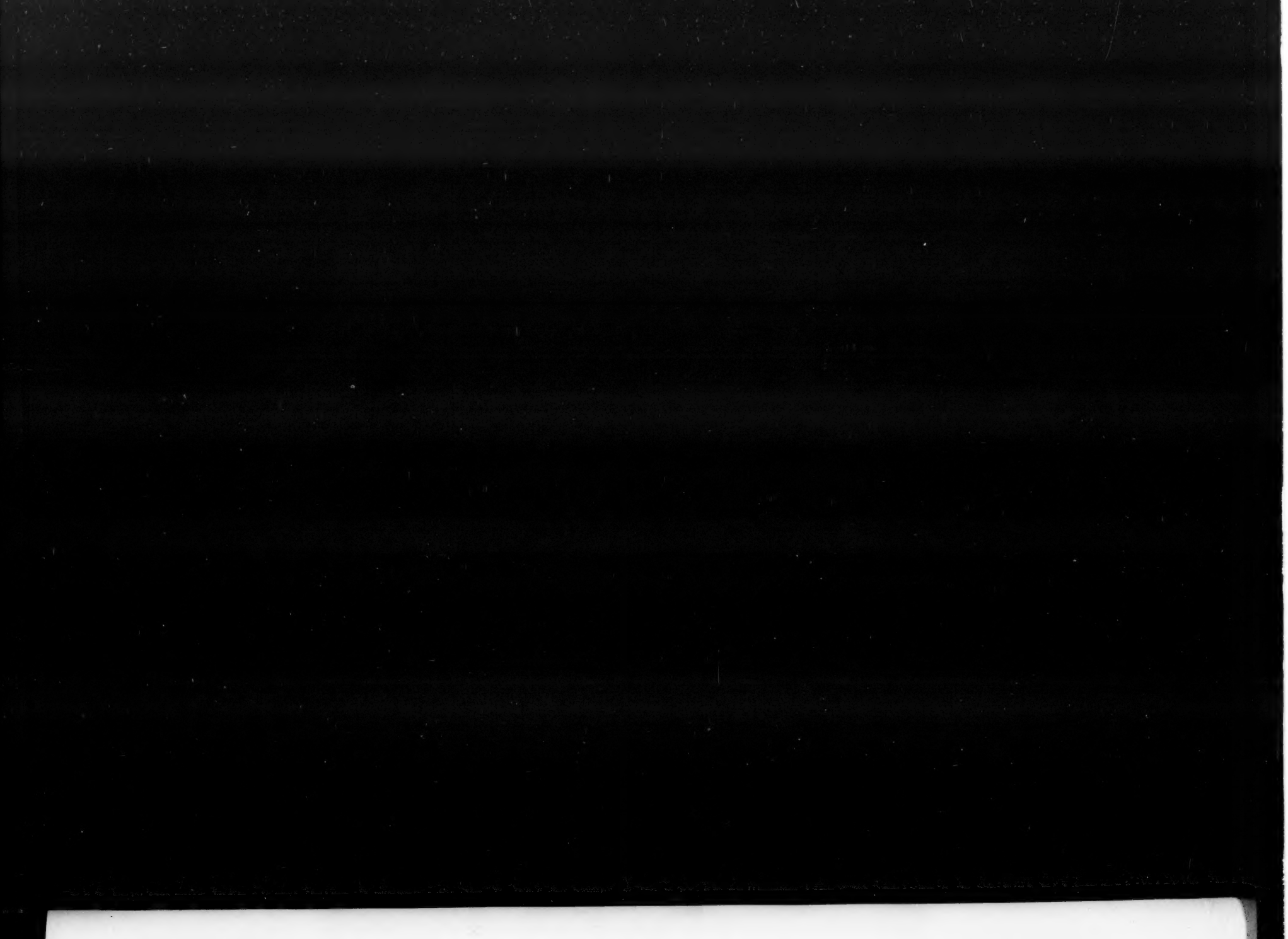
GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS PRODUCT OR PRODUCTION

Salem - Ohio

Canadian Associates • CANEFCO LIMITED • Toronto 1, Canada



EF gas fired and electric hood, pit and other batch and continuous type furnaces are available for normalizing rod, annealing wire, strip and other processes.



An EF continuous bright annealing furnace in which the wire is conveyed through the various zones on two parallel rows of bulkhead type trays.